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COMPUTERWORLD

Big iron seeks alternate fuel to sustain revival

"People who thought the mainframe was going to die overlooked a lot of things."

— Carl Gerberich, IS vice president, Marist College

By Craig Stedman

OK, we all know the mainframe isn't dead after all. Big iron rose from the grave in early 1994 and is reveling in an unexpected second life.

Data center managers feel vindicated, and gleeful IBM salespeople are raking in the big commissions once again.

So far, so good. So what?

Left unanswered amid all the backslapping is whether the revival can be sustained. Based on interviews with 20 mainframe users and analysts, that should be no sweat in the short term.

But beyond the year 2000, continued gangbusters growth begins to look less like a sure bet. Some of the forces putting the oomph behind mainframes are expected to lose steam. And System/390s haven't yet shown they can compete with Unix and Windows NT platforms for the right to host client/server applications.

Of course, a lot can change between now and then. And there doesn't seem to be any danger of re-

Big iron, page 28

ISDN anger

Requested rate hike may hinder expansion, use

By Bob Wallace and Neal Weinberg

ISDN rate hike requests filed by Pacific Bell and US West, Inc. could have broad and negative implications for use and expansion of the service nationwide.

If approved by state regulators in the coming weeks, the hikes would deal a heavy blow to all segments of the networking industry. Those in harm's way include users looking to launch telecommuting programs, Internet service providers using Integrated Services Digital Network to provide user access and internetworking vendors selling ISDN-capable equipment.

Independent of each other, Pacific Telesis Group subsidiary Pac Bell filed a rate hike in California, and US West said it will seek to restructure rates in all 14 of its states. Yet US West's bid to raise prices for its flat-rate ISDN service from $63 a month to $184 a month in Washington state was shot down last week by the state's regulators.

ISDN is a service provided by the region-

ISDN, page 107

Apple loss will force fourth restructuring, major layoffs

By Lisa Picarille
SAN FRANCISCO

At an otherwise ho-hum Macworld last week, Apple Computer, Inc. announced it expects to post a larger-than-expected loss for its first fiscal quarter.

Most show attendees, being loyal Macintosh users, weren't seriously shaken up by the news. But rabid Macintosh fans in corporate environments acknowledged they will now have to defend their platform choice to their bosses. Industry observers predict that companies on the fence about buying Macintoshes or PCs are more likely to avoid dealing with Apple.

The loss, which Apple blamed on pricing pressures and lower-than-expected product demand, is expected to trigger yet another

Apple, page 107

IS wins bout with nature

By Thomas Hoffman

The Blizzard of '96 left millions of workers stranded at home last week, whining about limited Internet access and winded after digging out from under as much as 30 inches of snow.

But don't expect any sympathy from IS managers, who took a hit on the chin from Mother Nature and kept their corporate systems humming.

Indeed, brave-hearted information systems executives from Kentucky to the frozen North surmounted unplowed roads, crippled transit systems, waist-deep snow and gale-force winds in a quest to stay operational during the biggest snowstorm to hit the eastern corridor in decades.

Working it out

The storm resulted in few power outages and data center snafus, but it challenged many to find ways to retrieve their stranded staff.

That was especially true in states such as New York and New Jersey, where all but emergency vehicles were banned from the roads until the storm passed.

Four-wheel drive

Blizzard, page 14

Newspaper

In the Mind of

'MOST WANTED'

Hacker, Kevin Mitnick

Turn to In Depth, page 87, for more exclusive excerpts from the upcoming book The Fugitive Game, about notorious cyberpunk Kevin Mitnick.

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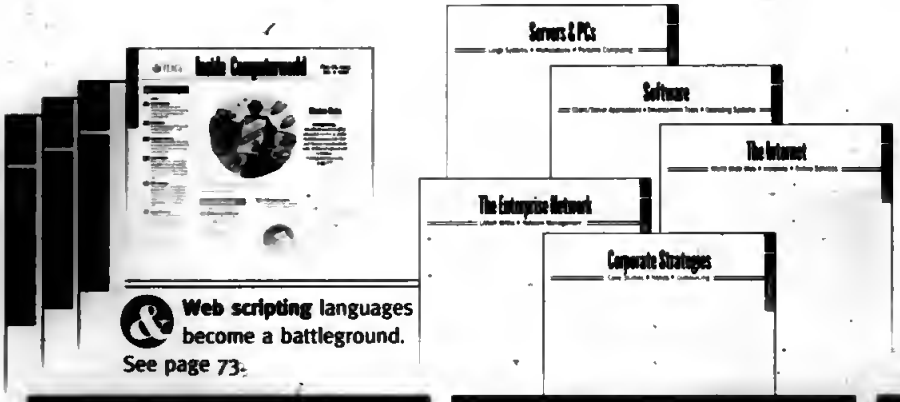

Web scripting languages become a battleground.
See page 73.

Trends
Feature Articles
Special Reports
News

Format Changes

for Easier Access and Readability

You have more to do and less time to do it. Starting last summer we instituted a series of format changes that let you access information quickly and easily. Here's a sample of these changes:

- **Page tabs** that are color coded by section (news, technical sections, features);
- **A redesigned Table of Contents** that helps you find the stories of most interest to you;
- **Icons** at the end of a story that guide you to another story of related interest;
- **Revised and expanded guide** to contacting the editors.

Five New Sections

Five Weekly Technical Sections

Starting with this issue, you'll find five new sections that better reflect the technology landscape now and in the future. All in an easy-to-access, easy-to-read format immediately following our News pages:

- **Servers & PCs**
  Large Systems • Workstations • Portable Computing;
- **Software**
  Client/Server Applications • Development Tools • Operating Systems;
- **The Enterprise Network**
  LANs • WANs • Network Management;
- **The Internet**
  World Wide Web • Intranets • On-line Services;
- **Corporate Strategies**
  Technology at Work • User Trends • Outsourcing.

Expanded Coverage

of the Leading Edge Technologies that impact Your Business

Through news, comprehensive feature articles and special reports, our staff of over 60 editorial professionals uncover the latest developments in major IT trends and issues:

- **In-depth Coverage of the Internet;**
- **Distributed Computing;**
- **Multiprocessing Hardware;**
- **32-Bit Operating Systems;**
- **Electronic Commerce;**
- **Data Warehousing and OLAP;**
- **Portable and Remote Computing;**
- **System and Network Management.**

COMPUTERWORLD
Everything you need to know.

A PUBLICATION OF IDG

Inside Computerworld

Jan. 15, 1996

News

NEWS

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Users say the sale of Dun & Bradstreet Software could bring the applications vendor some much-needed stability.

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A group of server vendors is almost done hammering out a specification that promises to make the Intel architecture a low-cost alternative to other kinds of clustered machines.

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Thanks to new Novell NLM gateway options for GroupWise, users can manage GroupWise from one box.

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Paul Antico

Notebook PCs *pack almost as much punch as their desktop brethren and are judged by the same tough standards.*
Buyer's Guide, page 79

Choice Cuts

Our man in Framingham, *Craig Stedman, sends a message to Hollywood: Give the year 2000 issue its day in the celluloid sun.*
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Knowledge management is for real. *It's here. And we'll show you how you can use it.*
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alt.cw

There's a lot of talk about "skinny clients" and flat-panel screens, but now there really is a PC peripheral that is just ½ in. thick. The $3,500 Modula Executive Desk Pad from Source Innovations in Long Beach, Calif., combines a computer screen, keyboard, cursor controls, speakers and microphone in an aluminum frame. The touch-screen pad, which connects to a standard PC under the desk, is covered with a nonscratch, anti-glare, waterproof, shock- and temperature-resistant film. What isn't clear is how you find it under a pile of papers.

German authorities have an odd notion about what constitutes pornography — or so it appears from a list of newsgroups that prosecutors recently forced CompuServe to ban. Included on the German list was alt.sexy.bald.captains, a newsgroup for fans of Capt. Jean-Luc Picard, the Kojak-domed character on TV's *Star Trek: The Next Generation*. Also on the list were several ClariNet newsgroups that offer mainstream wire service news reports, with steamy headlines such as "Vatican: Sex education not okay" and "Lesbian wins job bias suit." In fact, CompuServe never carried ClariNet news. — *Mitch Wagner*

Compiled by Kim S. Nash and Mitch Betts

Tribologist
a lubrication expert at disk drive maker Maxtor in Longmont, Colo.

Call triage agent
at the PC help desk of Northwestern Memorial Hospital in Chicago

Manager of critical problems
at Novell in San Jose, Calif.

Re-engineering change facilitator for information technology
at Corning in Corning, N.Y.

Vice president of people systems
at Saturn in Spring Hill, Tenn.

The Internet will displace private-line and frame-relay networks — a $10 billion marketplace dominated by AT&T — as the predominant means of corporate wide-area connectivity by the year 2000, predicts Forrester Research in Cambridge, Mass. **Although the 10-year outlook** for electronic commerce is bullish, 1996 will be a year of disappointment, with development of a significant customer base expected to be slow. By this time next year, 20% of the big companies that currently have Web sites will have bailed out, resulting in "ghost sites," predicts International Data Corp. in Framingham, Mass.

■ **Send contributions of off-beat news, lists and anecdotes to mbetts@cw.com.**

Are folks in cyberspace bad-mouthing your company or products? You can find out with a service called EWatch from PR Newswire's Miami office. The service will scan internet, Usenet and on-line forums for messages about your firm or any keyword.

Digital Frontiers

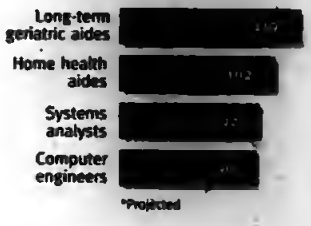
Computers cost jobs, at least according to the city of Brussels. So last month, the city council approved a 1,000 Belgian franc (U.S. $34) tax per year on all computer screens used by companies.

The tax, which took effect Jan. 1, replaces a tax the city fathers had levied on motors at the turn of the century. They had believed all motors — both electric and steam — would cost jobs, said a spokesman for the city's finance office.

Small businesses may see their annual tax payments slashed if they have fewer VDTs than motors. But the city expects to raise $900,000 per year from the tax — almost exactly the same amount as from the old motor tax, the spokesman said.

— Elizabeth de Bony, IDG News Service

GROWTH RATE OF THE FASTEST-GROWING U.S. JOBS, FROM 1994 TO 2005*



Source: U.S. Bureau of Labor Statistics, Washington

factoid of the week

A recent study cited Stanford University, MIT, the University of California at Berkeley, Carnegie Mellon University and Cornell University as having the top computer science doctoral programs. The National Research Council rankings can be analyzed using an interactive database at the following Web site: http://cra.org/NRCStudy/.

News shorts

Digital beefs up its popular Web searcher

Skyrocketing usage of Digital's Alta Vista search engine on the Web has prompted inventors at the company to beef up the server behind it.

Since its introduction Dec. 15 at http://www.altavista.digital.com, Alta Vista has seen the number of queries zoom from 300,000 hits to an average of 2 million daily, according to Digital.

"It was just a [few] hundred thousand [queries] a day, and then it went boom, boom, boom," a spokesman said.

The company's lab in Palo Alto, Calif., operates the Web search engine on an AlphaServer 8400 running on Digital Unix. What started out as a two-processor symmetrical multiprocessing server is now up to 10 processors. Plans call for adding another pair of 64-bit Alpha microprocessors within two weeks and upgrading the server memory to 4G bytes from 2G bytes. — *Michael Goldberg*

SunService to offer Internet, Java training

Trying to satisfy the corporate appetite for all things Internet-related, Sun Microsystems' SunService division is rolling out Internet education and training services to meet the needs of executives, end users and programmers.

Among other offerings, SunService, based in Milpitas, Calif., this week will announce computer-based courseware that can teach programmers how to develop Internet-based applications using Sun's Java programming language.

"There's huge potential for this kind of training," said Kurt Johnson, director of support services at International Data Corp. in Framingham, Mass.

SunService also will announce the March 1 rollout of a vendor integration program, SunVIP, that offers customers one-call support for disparate network computing systems and software.

— Thomas Hoffman

MSN gets faster client

Microsoft last week released a new version of the client software for The Microsoft Network (MSN) designed to speed up access to the on-line service.

The version permits caching multimedia documents locally, so the second time those documents are viewed, they can be called up from disk rather than downloaded anew from the service.

Microsoft hopes the software will ease complaints about slow access speeds. Even users with 28.8K bit/sec. modems and Pentium-based machines complain about the time spent downloading and processing graphics.

—Mitch Wagner

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D&B Software users cheer sell-off plan

By Julia King

Put a software company on the auction block, and its customers typically respond with a lot of hand-wringing.

But not users of Atlanta-based Dun & Bradstreet Software. Its parent company, The Dun & Bradstreet Corp. in Wilton, Conn., is selling off the software company as part of a sweeping reorganization announced last week.

D&B Software users are hopeful about the change. They said new owners could bring greater stability to the applications vendor.

That would, in turn, help better define the company's product and marketing strategies.

"Over the last year and a half, D&B has reorganized about every other day. Management has changed so often that [D&B] consultants here never even knew who their manager was," said Henry Sutton, information technology manager at Utah's Department of Administrative Services in Salt Lake City.

"I don't think it was ever a marriage made in heaven. The cultures of a software company and a bean counter company are top diametrically opposed," said Dick Hudson, chief information officer at Global Marine, Inc., a $500 million offshore drilling company and D&B user in Houston.

A prime example, Hudson said, was when D&B asked Global Marine to pay the travel and hotel expenses incurred by D&B marketing representatives who went to Houston to demonstrate D&B Software's SmartStream client/server software.

"They actually wanted me to pay them to show me their product," Hudson said.

Last week, D&B Software CEO Doug McIntyre said the company will continue on its client/server development course, hiring 100 new software developers and investing approximately $70 million in new products through 1996.

Products: SmartStream, a suite of client/server enter-prise applications, and Millennium, a host based financial package

SmartStream customers worldwide: 500

1995 revenue from all software: $350 million

1995 revenue from client/server software: More than $100 million

1996 plans: $70 million will be invested in research and development of client/server products

Targeting client/server

D&B Software's SmartStream suite of applications, released last year, is positioned to compete against SAP AG's R/3 business software and PeopleSoft, Inc.'s integrated suite of client/server applications.

Currently, about 40% of D&B Software's client/server sales are to new customers, "so we're not cannibalizing our market for host applications," McIntyre said.

But McIntyre also acknowledged that because D&B Software's SmartStream applications were "built purely from scratch, there is no easy migration to the client/server systems. It's a laborious transition."

Analysts and other industry observers also see the sale as good for D&B Software users. Several maintain the vendor's progress in the client/server market has been thwarted by its parent company's focus on the bottom line.

"When I was part of D&B Corp., the focus at the different divisions was always purely on the numbers," said Frank Dodge, former CEO of McCormack & Dodge Software, which D&B purchased in 1983.

"What that says is there is not much of a market or product strategy," added Dodge, who is now president of Dodge Group, a client/server applications vendor and D&B Software rival based in Waltham, Mass.

"So far, D&B Software has failed to articulate what they are all about," said Jack Maynard, an analyst at Aberdeen Group, Inc. in Boston. "As an organization, D&B Software is still in search of themselves."

Security prompts Web-testing tools

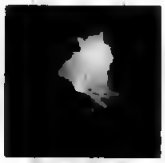
New products protect against 'a lot of crazy users out there'

By Frank Hayes

As developers get serious about creating commercial sites on the World Wide Web, Mercury Interactive Corp. this week will announce tools for rigorously testing Web sites and Web-based applications.

Is that overkill for something as simple as a Web page? Not according to users, who say testing tools are already long overdue in the nascent Web world.

"The biggest reason is security," said David Rodrigues, a software testing engineer at Turner Broadcasting System, Inc. in Atlanta. A site on the Web displays a company's public image, and that can be damaged intentionally by hackers — or accidentally by ordinary users who are simply experimenting.



The Web

"There are a lot of crazy users out there, and they'll try lots of different things," Rodrigues said.

To automate testing those links, Mercury plans to extend its current line of automated testing tools to support the Web. The new tools, dubbed WebTest, are scheduled to ship in March as add-ons to the company's WinRunner, XRunner and LoadRunner products.

Prices will start at $149 for the WebTest add-on to the Windows-based WinRunner, which itself costs $2,850, according to the Sunnyvale, Calif.-based company.

The WebTest tools will let developers create scripts to put every page in a Web site through its paces. The tools will help Web developers verify that each link works properly and spot links that are no longer valid. They can also verify that data returned from Web-based querying tools is correct and in the right format.

Along with functional testing, WebTest will allow load testing for Web sites — a critically important element for commercial sites, said Bart Meltzer, technical webmaster at Virtual Vineyards in Los Altos, Calif., a Web-based wine retailer.

"We have thousands of [Web] pages for hundreds of products, all built on the fly," said Meltzer, who has been briefed on the new tools. "A slow site loses the customer's interest, so it's important for us to know how fast pages are delivered."

The tools will also allow Virtual Vineyards to verify that prices are correct. "We can't possibly test everything by hand, and this will let us build the highest quality Web site," he said.

Meet the Webstones. They're the modern benchmarkology. See page 67.

Mac-based Java kits coming

Roaster Professional can build cross-platform applications

By Lisa Picarille
SAN FRANCISCO

Natural Intelligence, Inc. announced at last week's Macworld Expo held here that it is readying a Macintosh development environment for creating stand-alone, cross-platform applications based on Sun Microsystems, Inc.'s Java programming language.

Called Roaster Professional, the forthcoming set of application development tools is based on the company's Roaster product, which is the first development environment for creating Java applets.

Industry watchers expect the wildly popular Java to be even more successful once users have tools to create full-fledged applications.

"Java will really take off when users can start building applications with it," said Neil McManus, executive editor of "Digital Media," an industry newsletter in San Francisco.

"Right now, all users see is dancing little animations on their screen. That's just window dressing," he said. "But when people can build applications that have things like live stock quotes and automatically updated numbers, then [Java] will be really useful."

Roaster Professional will inherit many of Roaster's features, such as a hierarchical project window, source code editor, Java compiler, debugger and runtime engine. The Professional version adds the following key components:

- A Java class library specifically designed for creating stand-alone cross-platform applications.
- A visual screen builder for rapid prototyping and interface construction.
- Native compilers that compile Java into cross-platform byte codes and then into native code for the Power Macintosh and for Windows 95 or Windows NT.

Roaster Professional for the Macintosh is slated to ship mid-year. Windows 95 and Windows NT versions are due out by the end of the year, according to Joshua Wachs, president of the Cambridge, Mass., company.

If Roaster Professional is delivered according to schedule, it may be six months to a year ahead of rival products.

"Java has captured the imagination of the world, and the first company to have a development system for full-blown applications will have a big advantage," McManus said.

"It would really make life easier to have productivity applications that are not only Web-aware but based from the ground up on Java," said Charles Merenda, director of student support services at Chesapeake College in Wye Mills, Md.

Java development kits are also expected to help bolster the Macintosh's overall position in the corporate market. "Java is the great leveler for the Macintosh. Now developers can create an application just one time, and it will run on both Mac and Windows," McManus said.

So you want to be an object-oriented programmer. See page 91.

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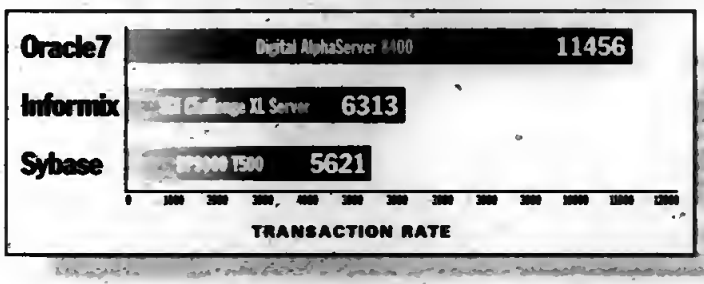

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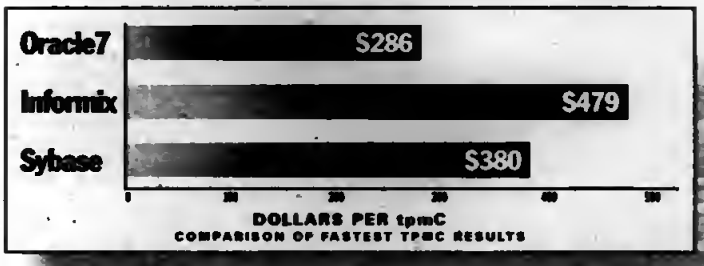

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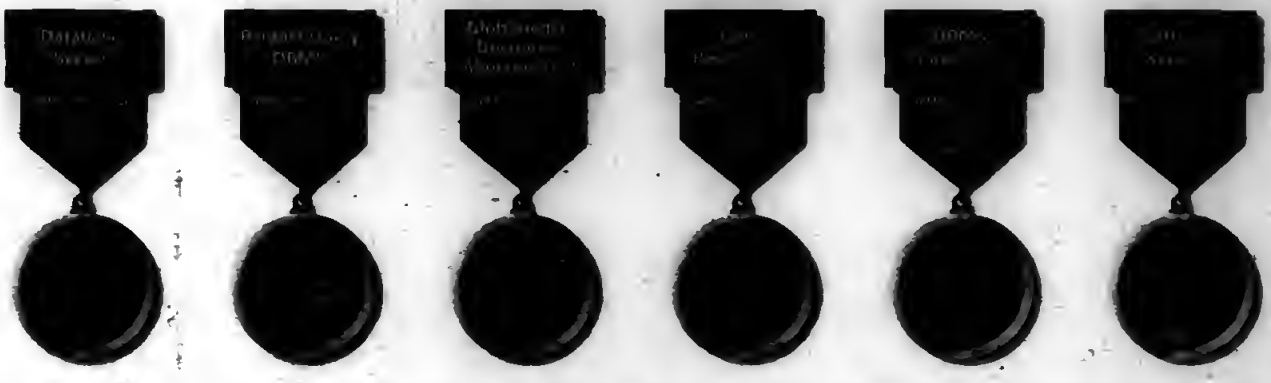

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NT 4.0 will have a Win 95 look and feel

By Stuart J. Johnston and Laura DiDio

Microsoft Corp. isn't taking any chances: While it waits for Windows 95 to catch on with corporate information systems, it is preparing a version of Windows NT with a Windows 95 look and feel.

Release 4.0 of NT also is called the Shell Update Release. Some early beta copies have been sent to developers, but a more widespread beta is planned in the next few weeks, the final release will be by midyear, said Megan Bliss, group product manager for Windows NT Workstation.

Release 4.0 will sport beefed-up directory services capabilities for Microsoft's Domain Named Services (DNS). DNS is Microsoft's version of a directory service database, which contains a repository of all users and network objects. It gives users a single network log-on to access various network applications.

Users such as J. Matthew Merrick have been eagerly awaiting a Windows 95 user interface that provides the same look and feel on Windows NT Workstation that Windows 95 provides. "It's a nice touch for my users," said the vice president of IS at The Merrick Publishing Co. in Louisville, Ky. "It means less confusion for them [and] less downtime spent training them."

Merrick said his firm has been using "every feature" in the current Windows NT Server Version 3.51 and hopes to have the beta version for the Shell Update 4.0 release within the next few weeks.

Object feature possible

And while company officials say they can't make promises yet, NT 4.0 also may include a key object networking technology that was planned for a later NT version.

That technology, called Network OLE, will let OLE-enabled applications communicate transparently over a network. This extends OLE to a multiuser environment.

OLE is Microsoft's 5-year-old object technology for linking data interactions among applications.

The vendor is "definitely trying" to get Network OLE into NT 4.0, said Jeff Alger, Microsoft's senior manager for enterprise developer marketing.

"Anything that enhances our ability to use the network is a good thing," said Briscoe Stephens, coordinator for space sciences in the Advanced Scientific Information Systems group at NASA in Huntsville, Ala.

IS VP J. Matthew Merrick: *Same look and feel 'means ... less downtime spent training'*

Cairo is the next major release of NT after NT 4.0 and is due in 1997 at the earliest. Cairo adds global network directory services and an object-oriented file system to NT.

Although some users are anxious to get Network OLE, even more are busy waiting for NT to gain the Windows 95 interface.

"I prefer the robustness of NT over Windows 95,", but NT with the Windows 95 interface would be even better, said Walter Taucher, president of Corporate Computer, Inc., a Microsoft reseller in Seattle. One of his customers just ordered 7,000 units of Windows 95, he said.

Replacement Windows

Microsoft's Windows NT 4.0 is due midyear and will enter beta testing in the next few weeks. New features will include the following:

- Windows 95 user interface
- Network OLE*
- Exchange client
- ISDN dial-up support
- Telephony API support
- Internet Information Server for Windows NT Server

* Not in the initial beta, but may be in later test versions

Digital tries to get support for integrating NT and OpenVMS. See page 49.

Microsoft to build 'lite' interactive PC

By Computerworld Staff

Microsoft Corp. wants to see less complex PCs better suited for multimedia functions and Internet navigation by next year.

An initiative called the "Simply Interactive PC for 1997" will be one of the highlights at the Windows Hardware Engineering Conference to be held in San Jose, Calif., in April.

'Simple' PCs

The idea is to turn the familiar, and increasingly complex, PC into an easier-to-use appliance positioned as "the best platform for entertainment, Internet access and communications," according to company documents cited last week in *Electronic Engineering Times*, sponsor of the upcoming conference.

"It's the theme for the next major version of Windows 95," said Jesse Berst, editorial director of the "Windows Watcher" newsletter in Redmond, Wash. "They're defining the software and hardware reference platform in advance to avoid an 'OS/2 fiasco' of nothing to run when it ships."

Microsoft last week said that new 32-bit Windows driver software is planned; it will improve the performance and streamline the functionality of PCs based on Intel Corp. chips.

"Any time they talk about cleaning up the low-level drivers, that sounds good to us," said a desktop systems manager at an IS organization responsible for 10,000 corporate PCs.

Efforts for simpler PCs focus on communications such as Internet access, improved graphics processing and displays, and better system software that could free users from having to edit their configuration files.

Simpler PCs could dampen interest in Internet "appliances," or terminals that would let users browse networks, download only those application modules they need and store personal files on remote servers. But many users reject the loss of independence such a configuration poses.

PC vendors such as Compaq Computer Corp., Packard Bell Electronics, Inc. and Acer America, Inc. have expressed interest in "network-based" PCs.

Compaq, Gateway 2000, Inc. and Toshiba America Information Systems, Inc. already are working with Microsoft on units that use a separate operating system tooled for network links, Berst said. The simple PC initiative doesn't respond directly to Internet appliances, he said.

Is Win 95 a tough sell?

Sources claim 19M copies sold, but skeptics hold Microsoft stock hostage

By Stuart J. Johnston

Microsoft Corp.'s stock fell several points but then rebounded last week amid fears that the company this week would report weaker sales of Windows 95 than expected.

But sources close to the company said Microsoft will likely report that it sold between 17 million and 19 million copies of Windows 95 in the last four months of 1995, mostly to consumers.

Many corporate information systems groups apparently are waiting longer than the company thought they would to decide whether or when to deploy Windows 95. Microsoft officials thought the migration would be more briskly under way by now.

But even before Windows 95 shipped in August, corporate IS managers said they would wait until at least the first few months of this year before beginning serious deployment.

A *Computerworld* survey of corporate IS beta testers conducted in July found that only 29% recommended moving to Windows 95 in 1995. A whopping 65% said they would recommend deployment beginning this year or later.

But Microsoft's own survey last fall challenges that. Their poll found that among corporate beta testers, 47% already had begun deploying Windows 95 in their companies.

"The demand has been exactly what we expected," said a spokeswoman for Stream International, Inc. in Norwood, Mass., a major corporate reseller.

Corporate IS shops are confused by the fact that Microsoft offers two 32-bit operating systems for the desktop. That sends a mixed message to corporate users about Windows 95 and Windows NT Workstation, said Dwight Davis, editor of "Windows Watcher," an industry newsletter in Redmond, Wash.

Some large companies have decided to skip Windows 95 and go directly to NT Workstation, including Charles Schwab & Co., which last fall chose to install 5,000 to 6,000 copies of NT Workstation.

Take your pick

Estimated unit sales of Windows 95 from Aug. 24 through Dec. 31, 1995

Source	Units sold*
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	18.1M

*Includes retail units and units bundled in new PCs

Yet for every corporation that has gone the NT route, many more have chosen Windows 95, partly because it is much less expensive to deploy.

Many corporate users also have noted in recent months that they are considering a mix of NT Workstation and Windows 95.

"We had several groups that didn't want to go to Windows 95 but to NT Workstation," said Daniel Kleyn, an information engineer at Cinergy, Inc. a multistate gas and electric utility with headquarters in Cincinnati, Ohio. But the company already has deployed 2,500 copies of Windows 95 and is adding 50 to 75 more each week, he said.

"There are clearly going to be a lot more Windows 95 units than NT units in corporations for a long time," Davis said.

Some corporate users also are waiting until Microsoft ships the first Windows 95 Service Pack, which is due in the next month or two. The service packs will include extra device drivers, added functions and components and several bug fixes.

Microsoft this month is expected to take as-yet-unspecified measures to encourage corporate users to adopt a mix of Windows 95 and Windows NT Workstation.

Micro Focus Challenge 2000 Program

As challenging as it seems, it's a problem that's only going to get more dangerous with time. Today, 20% of business applications cannot handle dates after the turn of the century. By the year 2000 that number will increase to 90%.* Those that aren't converted will fail. The Micro Focus Challenge 2000 Program gives you a comprehensive program of tools and services to fully assess and implement the century date change. Start with the Application Express Offloader™ tool to automatically move the application to a PC. Use Micro Focus' Revolve® Year 2000 analysis tools to inexpensively locate the problem areas. Then, modify the application with Micro Focus COBOL Workbench.® You can even choose to replace your date logic with TransCentury® Calendar Routines. It's quick. It's efficient. It's complete. It's also an effective first step towards reengineering your legacy COBOL applications. After all, fixing a business application should be as quick and painless as possible (right Fido?).

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Client/server vendors steer automakers toward EDI enhancements

By Julia King

SAP AG and System Software Associates, Inc. are racing to steer automotive customers toward their enterprise client/server software.

SAP in Philadelphia last week announced it will provide these users with custom electronic data interchange (EDI) interfaces to its R/3 client/server system.

Meanwhile, SSA in Chicago launched its first automotive centers of excellence, where potential customers can test-drive its BPCS client/server software for IBM AS/400 and Unix platforms. The centers are in Detroit, London and Dusseldorf, Germany.

SSA said it also offers automotive customers EDI links to BPCS.

SAP R/3 users — including BMW in Spartanburg, S.C., which builds the Z3 Roadster used in the latest James Bond movie — must dedicate several programmers to creating and maintaining EDI-to-R/3 software interfaces

The automotive market is valued at $180 billion worldwide and represents a highly attractive customer base to client/server vendors. It also represents a largely untapped market, since automotive companies traditionally have relied on homegrown information systems.

EDI a must

Because EDI capabilities are critical to getting a piece of the automotive market, software vendors are aggressively teaming up with EDI software vendors.

"If you don't have EDI in the automotive market, that would make or break a sale," said Bill McSpadden, president of Plant-Wide Research Group, Inc., a manufacturing software research firm in Billerica, Mass.

SAP will work with Sterling Software, Inc., an EDI software vendor in Dallas, to develop and maintain software-based maps of the hundreds of EDI formats that are used by automotive manufacturers and suppliers in the electronic ordering and billing process.

The automotive industry officially has embraced dozens of EDI transaction sets. Still, auto manufacturers continue to implement their own standards, and that has increased the number of EDI formats that suppliers must support.

The maps will let users automatically transmit EDI-based data between their trading partners' systems and their in-house R/3 system.

Pricing for the software hasn't been established, but the maps will be packaged according to customers' individual requirements, said Greg Mekjian, director of SAP's Automotive Industry Center of Expertise.

SSA's EDI partner is Harbinger Corp. in Atlanta.

SSA provides its EDI maps as part of its BPCS software, according to Scott Macdonald, director of automotive industry development.

This cuts costs significantly for SSA customers such as Standard Products Canada Ltd. in Stratford, Ont. The company supplies weather stripping for automobiles.

"There are [EDI] transactions standards, but in fact, each manufacturer does things a little bit differently," said Harold Reese, director of information systems at Standard Products.

"The overhead to keep track of maintaining the different [EDI] transaction sets can be quite significant. Also, the level of technical expertise that's required can be fairly significant, so the opportunity to have that provided as a service from your applications vendor is extremely appealing," he added.

Client/server management software can save companies big bucks. See page 52.

News Shorts

Notes 4.0 gets snowed in

Lotus Development Corp. employees may have to get out their shovels if they want Notes to hit the streets in time for the Lotusphere '96 show in Orlando, Fla., next week. Some manufacturing materials were delayed at airports because of the winter storm early last week, so Lotus couldn't begin delivery of Notes 4.0 on Jan. 10 as promised. Officials at the Cambridge, Mass., company said the delay would be short and the Notes upgrade would be available as soon as possible. Unix versions will be available in 90 days.

Wang leaves Symantec

Gene Wang has resigned as executive vice president of applications and development tools at **Symantec Corp.** to join a medical robotics company in Goleta, Calif. Wang's tenure at Symantec has been dogged by allegations that he stole trade secrets from his former employer, Borland International, Inc., when he joined Symantec in September 1992. Wang and Symantec CEO Gordon Eubanks were indicted by a grand jury in 1993, but the case hasn't yet come to trial. A civil lawsuit by Borland also is pending.

Justice Department drops probe of Zimmermann

The Department of Justice last week abandoned its criminal investigation of **Philip Zimmermann**, the Boulder, Colo.-based programmer who wrote the widely used encryption product Pretty Good Privacy (PGP). Zimmermann was accused of violating export laws because he posted PGP on the Internet, allowing it to be downloaded overseas. The government gave no reason why it abandoned its case. Zimmermann had prepared a defense on First Amendment grounds.

Lotusphere lovefest

Lotus' Lotusphere '96 conference in Orlando next week is looking like a lovefest between Notes 4.0 and other IBM units. The RS/6000 division will detail its plans to support Notes 4.0 on its servers. Meanwhile, IBM's storage operation will announce that its ADSM backup software will get support in late March for backing up OS/2-based Notes 4.0 databases without taking them off-line. Ties between Notes 4.0 and IBM's MQSeries messaging middleware also will be announced next week [CW, Jan. 8].

Xilinx taps HP's Roelandts

Xilinx, Inc., a San Jose, Calif.-based maker of programmable semiconductor chips, has named Willem "Wim" Roelandts, a Hewlett-Packard Co. veteran, as its CEO. In his 28-year career, Roelandts rose to vice president and general manager of HP's Computer Systems Organization in charge of Unix servers and workstations.

Virtual software store resells Microsoft products over Internet

Seattle-based **Online Interactive, Inc.** today will open a virtual software store that will resell Microsoft Corp. products electronically over the Internet. The AtOnce Software "store" offers 35 Microsoft products and targets corporate users with high-speed dedicated lines or cable modems. The store has a link from Microsoft's Internet home page and can also be reached at www.portsoft.com/atonce.

Older IBM AS/400 models get storage update

IBM has quietly enabled customers who use older models of the AS/400 to take advantage of the internal disk storage that had been offered only with the so-called "black box" systems introduced in the past two years. Some users are hoping internal storage will make upgrades and used versions of the older AS/400s more affordable. But IBM downplayed the feature as "a convenience" for back-level shops and said it doesn't expect much demand.

Borland's Delphi goes 32-bit, supports Windows 95, NT

Borland this week will announce plans to ship a 32-bit version of its Delphi development system this quarter. Delphi 2.0 will support Windows 95 and Windows NT and will include a centralized object repository and improved team development support. Prices will start at under $499 for the desktop version and $1,999 for the client/server suite.

SHORT TAKES **Microsoft** will lay off 120 workers at its floppy disk manufacturing plant in Bothell, Wash., because of increased demand for its products on CD-ROM. ... Edith W. Martin was named vice president of information systems and chief information officer at **Eastman Kodak Co.** in Rochester, N.Y. She succeeds John J. Chiazza, who is now general manager of U.S. operations. Martin had been chief technology officer at the Student Loan Marketing Association. ... **Sybase, Inc.** will buy **Visual Components, Inc.** in Lenexa, Kan., for $28 million in stock. Visual Components, which makes software components for use with visual development environments, will become the component division of Sybase's Powersoft Corp. subsidiary in Concord, Mass. ... **MCI Communications Corp.** plans to offer frame-relay access for electronic data interchange. The service, now in beta testing, won't require frame relay customers to purchase special equipment or a separate connection. ... **Lotus** is releasing the application programming interface for Organizer 2.1 to developers. This will let developers create applications that can pull information such as addresses or appointments out of the personal information manager software. ... **HP's** HP 500 Windows Application Server will support 32-bit Windows applications in the second half of the year.

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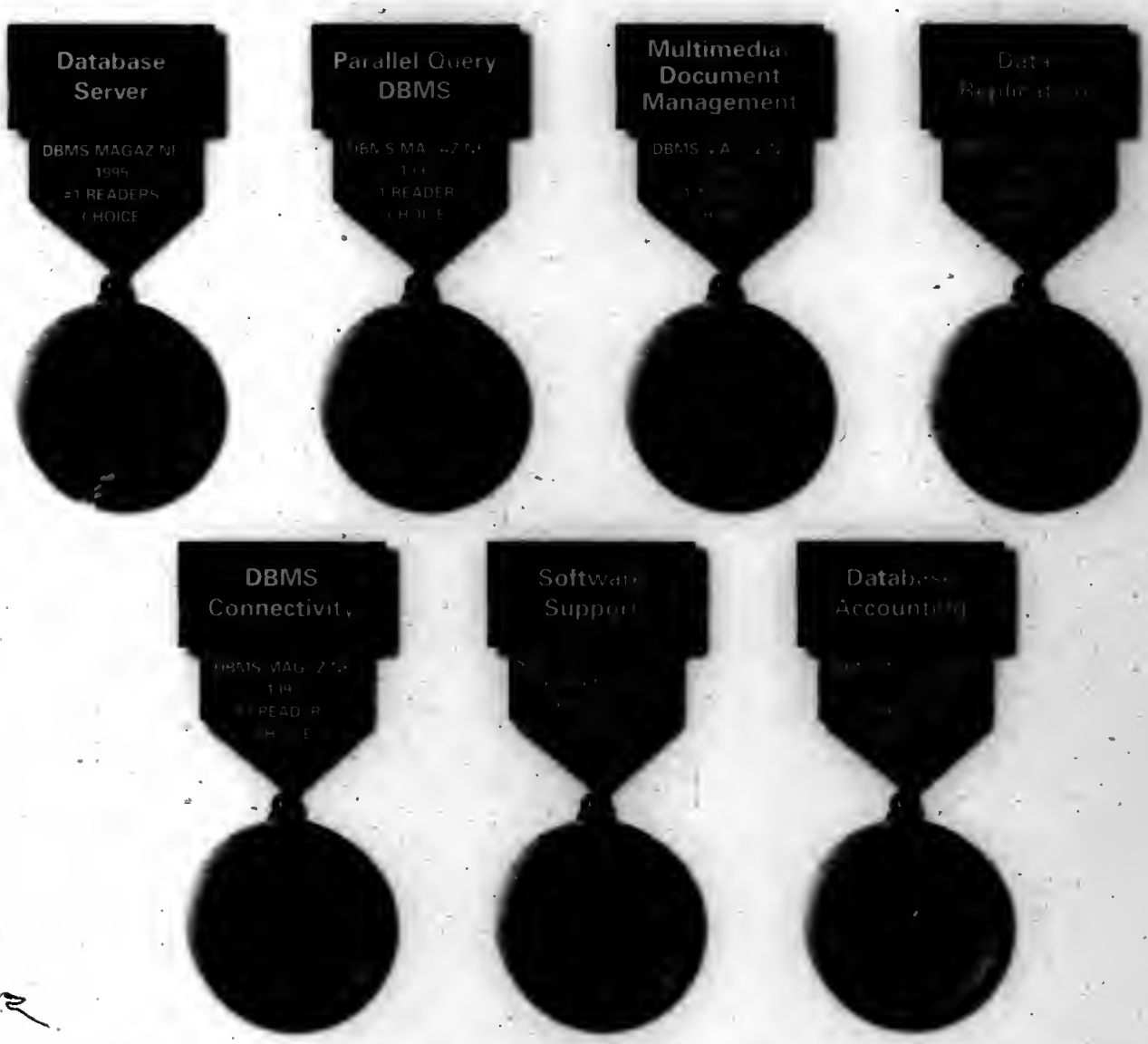

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PC heavyweights close in on clustering spec

By Bob Francis

A heavyweight group of Intel-based server vendors is hammering out the final draft of a clustering specification that promises to make PC servers a low-cost alternative to Unix-based and other proprietary clustered machines.

Among the vendors involved are Compaq Computer Corp., Hewlett-Packard Co., Intel Corp. and Microsoft Corp.

The specification will let software developers write to a common application programming interface (API) and I/O interface rather than to separate APIs for several different flavors of Windows NT or for the various clustering plans from companies such as Sequent Computer Systems, Inc. and Tandem Computers, Inc.

For large corporations downsizing to PC servers, this common ground on clustering will lend weight to the promise of high-powered, low-cost, Intel-based client/server computing.

"For us to begin to develop strong clustering applications with PC servers, we'll need vendors to really show they can provide us the tools we have on other platforms such as Unix and mainframe systems," said David Blanchard, a systems analyst at Quaker Oats Co. in Chicago. "If they get some standards in place, we'll see this as a more serious effort."

PC standards

The specification will provide a large enough umbrella to cover PC server clustering plans from several vendors. Beaverton, Ore.-based Sequent, for instance, uses nonuniform memory architecture, or NUMA, while Tandem uses ServerNet and HP relies on a Fibre Channel interconnect.

Persuasion, not coercion

Much like the symmetrical multiprocessing standard SMP 1.1 for Intel chips, companies won't be required to support the standard. But they probably will in order to use industry-standard hardware and software on their systems. Intel clearly wants the backing of PC server heavyweights such as Compaq and HP before proceeding, several officials involved in the talks said.

The specification also will enable the migration of high-bandwidth applications such as video and high-speed disk interconnects to a common PC server platform.

Actual shipments of clustered PC systems aren't expected until later this year.

Microsoft is expected to announce clustering capabilities for Windows NT early in the second quarter, and Compaq and HP are expected to offer PC server clusters at around the same time.

Yet most users and industry observers don't expect clustering on PC servers to begin to make serious inroads until 1997. "I can see we might do some testing of the concept later this year, but it'll be next year before we think it'll really be serious," Blanchard said.

Analysts said clustered Windows NT-based servers will offer the most serious challenge to Unix-based servers.

"Unix has a variety of operating systems, and those change constantly, so it's very difficult to keep those APIs straight," said Fared Neema, president of Peripheral Concepts, Inc., a research group in Santa Barbara, Calif.

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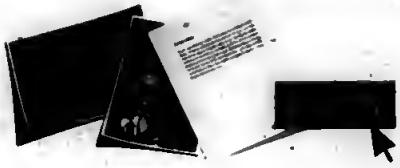

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Super manager

Max/Enterprise streamlines multiple net alarm monitoring

By Patrick Dryden

Monitoring complex networks that span legacy environments and client/server internetworks should get easier this week when Maxm Systems Corp. enhances its "manager of managers" software.

A new version of its Max/Enterprise automated event- and alarm-management server will integrate tightly with three leading network management platforms — Hewlett-Packard Co.'s OpenView, IBM's NetView and Cabletron Systems, Inc.'s Spectrum. It also will allow access from Windows clients.

That means administrators familiar with Simple Network Management Protocol (SNMP)-based tools, which are used to baby-sit hubs, routers and various network links, will be able to extend their care to legacy devices without becoming overwhelmed.

The common database consolidates events and filters out the most vital alerts, and a new console option allows monitoring and reporting from Windows stations throughout the network.

No longer isolated

Version 3.3 is available this week and should remove remaining "management islands" for operations staff members at Visa International, Inc. They rely on Max/Enterprise to put disparate alarms from diverse systems into a consistent format, said Tennis Smith, an automation specialist at Visa's headquarters in San Mateo, Calif.

"Now all the legacy stuff monitored by Max/Enterprise servers will be visible from the NetView consoles and look the same to operators," Smith said. "Hopefully, we can extend our automated management through this specific bridging between the two tools."

And OS/2 is no longer required to monitor a Max/Enterprise server. "Maintaining both Windows and OS/2 is too complex. This gets simpler all around since our environment is moving more and more to Microsoft," Smith said.

Nearly 200 organizations use Max/Enterprise to merge the management tasks of complex networks — those built on elements that communicate via the SNMP standard and on components such as 3270 devices, modem banks and phone switches with their own diverse management tools.

These enhancements should appeal to more administrators.

"Large enterprises needed this help as their management got more complicated. Now this server can move down to smaller companies as their networks become more business-critical, and they deal with rising complexity," said Sylvia Clark, an analyst at Aberdeen Group, Inc. in Boston.

Max/Enterprise offers more intelligence to handle alarms and events than other tools that work with network management platforms, Clark said.

"Close integration with these platforms provides a higher level of automation and promises less fine-tuning," she said.

Administrators get a more condensed alarm screen with Max/Enterprise than they could by adding tools for non-SNMP devices to their network management platforms, said Pam Casale, a vice president of marketing at Maxm in McLean, Va.

Pricing starts at $79,000 for the Max/Enterprise server. New Max/Open modules for linking to NetView, OpenView or Spectrum cost $15,000.

The Visionary console option costs $1,500 per Windows client.

New report and development kits also will be available this month.

Applications will get easier to manage. See page 59.

SNA, frame relay in 'sync'

Users able to reduce WAN charges, increase performance

By Bob Wallace

Users can slash WAN charges by 30% to 40% and boost performance by trading in low-speed private-line SNA networks for frame-relay service and emerging access devices, analysts claim.

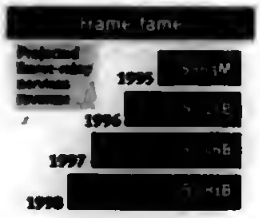
One vendor addressing this need is Sync Research, Inc. It fortified its position in the frame-relay access device market last week with a slate of gear that reportedly simplifies management by consolidating traffic on multiple protocols over one frame-relay network.

Sync's newly unveiled frame-relay access devices take IBM SNA, LAN and legacy protocol traffic, which had run on separate wide-area networks, and channels it to the industry's hottest public data service — frame relay.

Frame relay

"Moving to the Sync boxes lets users support multiple protocols with a single device, while agents in the software provide powerful network management capabilities," said Don Caubek, president of Gen2 Ventures, a consultancy in Saratoga, Calif.

Union Labor Life Insurance Co. in Washington is among the first to reap the benefits of Sync's products.



Source: Vertical Systems Group, Dedham, Mass.

"The combination of casting off our private lines for frame relay and installing the Sync boxes more than halved response time, let us run SNA, IP and IPX over one network and saved us $250,000 a year in WAN charges," said Mike Lestingi, senior project leader for data and voice communications networking at Union Labor.

This doesn't represent much lost business for carriers since they largely make up for it through frame-relay pricing.

In sync with market

Sync initially entered this lucrative market at the high end, creating a barrier to lower-end users, Caubek said. "Now, with the expansion down market of their product line and the packaging of the software, [Sync] has products for users of all sizes and [data networking] needs," he said.

Sync offers smaller models of its FrameNode 4000 frame-relay access devices — two-, four- and eight-port units that can be used alone or stacked as users' networking needs grow. It also offers new software packages for the devices.

The new products include the following:

- The 4200-2 line, which has two high-speed serial ports, two asynchronous ports for management and either no LAN port and one Ethernet port or a Token Ring port.
- The 4200-4 line, which has four serial ports and the same LAN port options.
- The 4200-8 line, which has eight serial ports and the same LAN port options.

Prices range from $1,995 for a 4200-2X that runs IBM frame-relay access device software to $5,195 for a 4200-8T with one Token Ring that runs Internetworking FRAD Plus software.

For smaller sites, Sync offers the following:

- The FrameNode 100, which has one serial port and can support one device, such as a controller. It has management capabilities and costs $995.
- The FrameNode 2200, which has two or three serial ports. It costs $1,795.

Zenith Data CruisePad adds remote access

By Mindy Blodgett

Zenith Data Systems has expanded its CruisePad wireless handheld computer system by adding mobile capabilities in the form of a multiuser applications server.

The MultiCruise system allows up to 60 multiple, concurrent Windows NT-based sessions via CruisePads on a central host server, according to Zenith Data in Buffalo Grove, Ill. The system will decrease costs and improve support, company officials said.

When CruisePad was released in 1994, the wireless, pen-based, handheld slate let locally remote users log on to a PC, access files and download information from other LAN users.

The MultiCruise system will let several CruisePad users remotely and simultaneously tap in to Windows-based sessions, via spread-spectrum radio, on one Zenith Data server. The server becomes a centralized information systems management system.

Zenith representatives say the product is targeted squarely at vertical industries such as health care and field service technicians.

This system will offer users a vast improvement, said Aaron Cherrington, president of Automated Vehicle Analysis, Inc. in San Diego. The firm used CruisePad to devise a diagnostic product that it sells to auto repair shops, which use the wireless devices to log repair data.

MultiCruise systems will let several CruisePad users remotely and simultaneously tap into Windows-based sessions

Randal Giusto, an analyst at International Data Corp. in Framingham, Mass., said the MultiCruise system will offer definite cost benefits.

"It is very attractive pricing when you consider that a user would be able to upgrade both hardware and software on the server rather than on each device," he said.

A typical 30-user MultiCruise configuration will cost about $68,575, or about $2,286 per user.

Check out our Buyer's Guide to Notebook PCs, page 79.

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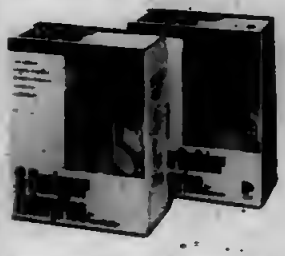

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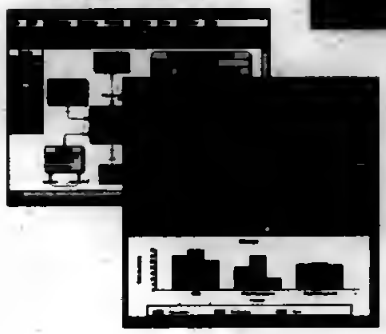

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IS manages to plow through Blizzard of '96

CONTINUED FROM COVER 1

rescued Connecticut On-Line Computer, Inc. in Avon, Conn., which provides data to banks. IS employees equipped with road-gripping vehicles gave rides to their less-winterized compatriots last Monday.

"We had a couple of people who really couldn't make it in," said Anthony Doucette, vice president of production at Connecticut On-Line. "But it was business as usual, and we were open 24 hours that day."

Solid contingency plans made the difference for many organizations.

Executives at the American Stock Exchange, for example, began placing a network of calls to 60 key engineers and operations people last Sunday morning to get those people into New York City by that evening, according to Bill Strauss, chief financial officer at the exchange.

"We stayed in hotels; we stayed with friends — we even set up cots in our boardroom," Strauss said. Despite the inclement weather and smaller-than-usual turnout, the Amex, the New York Stock Exchange and the NASDAQ exchange were operational on Monday, albeit on shortened trading cycles.

Smart preplanning by IS staff at the American Stock Exchange *let them beat the blizzard into New York to ensure that trading would be operational last Monday*

Command central

Telecommuting worked wonders for the IS staff in the crippled city of Philadelphia, which ended up with 30 inches of powder — some 3 inches more than its annual average. For example, the city usually begins its payroll run each Tuesday on an IBM 3090 Model 400J mainframe so that employees get their paychecks by Thursday. Last week, one of the city's IS managers initiated the payroll run from his home PC using a secured dial-up connection, according to John Carrow, chief information officer for the city.

"We did pretty well today [Tuesday] considering that only four of our 150 IS staffers made it into the office," Carrow added.

In Long Island City, N.Y., 1-800-MATTRESS fielded 1,067 sales calls on Monday and rerouted 30% of the daytime calls to its telemarketing unit in Deerfield Beach, Fla. Overnight traffic was rerouted from the company's AT&T Corp. private branch exchange system to the Florida office using AT&T's CallPath technology, according to John Leon, data processing manager at the company.

Telecommuting also played a big role for the bedding company. Executives such as Michael Loewenstein, director of sales recovery, were able to dial in to the company's IBM RS/6000 from home. Loewenstein used an IBM ThinkPad notebook computer on Monday to reschedule deliveries to 181 customers.

The storm also brought out the best in people. At Johns Hopkins Hospital in Baltimore, two data center operators coming off double shifts Monday afternoon volunteered for another four hours in the hospital's patient care area. They delivered linens and performed other helpful duties, according to Stephanie Reel, vice president of information services at the 1,000-bed facility.

Senior editor Craig Stedman contributed to this report.

Explosion blacks out weather site

Millions of workers who were left stranded at home by the blizzard hitched their sleighs to the Internet last week. But those who tried to tap in to The Weather Channel's home page on the World Wide Web (http://www.weather.com) couldn't access the latest radar at the height of the storm. InfiNet Co. in Norfolk, Va., a 'net access provider that houses The Weather Channel's Web server, lost power from Sunday afternoon until 10 a.m. Monday. An underground methane gas explosion had knocked out power to downtown Norfolk.

InfiNet said the firm ran operations on uninterruptible power supply systems for four hours. Then it went black for 12 to 16 hours. The site got more than 1 million hits in the four days leading up to and during the storm. — *Tom Hoffman*

Stranded workers abandon shovels, pick up the phone

By Mindy Blodgett

Telecommuting

During last week's East Coast blizzard, Kevin Danehy used his trusty snowblower to clear out his driveway and those of six neighbors.

But snow removal wasn't all he did. The manager of workgroup application development at Millipore Corp. in Bedford, Mass., wrote up agendas for two important meetings, answered electronic mail and conducted other business via Notes from his Haverhill, Mass., home. All in all, Danehy said he spent a very productive day weathering the monster storm by telecommuting.

"If anything, I accomplished more than I would have at the office," Danehy said. "The phones weren't ringing; people weren't wandering over to my desk. It was great."

Danehy wasn't alone on the telephone wires. Although it is hard to quantify, businesses and telecommunications companies report a sizable increase in telecommuting during this year's tough winter.

Phones were tied up by telecommuters and others during the blizzard. For example, during the Jan. 3 storm in New England, the local carrier, Nynex Corp., reported a 50% increase in telephone usage in some parts of Massachusetts. During last week's blizzard, Nynex reported a 10% increase in phone-line demand in the suburbs surrounding New York. Nynex theorized the 10% increase was due to suburban commuters who worked at home rather than struggle into the city.

Internet use also skyrocketed, with America Online reporting a 60% increase during the blizzard.

And carrier Bell Atlantic Corp. said the number of blocked calls, or calls that can't get through, tripled that same day (see story, page 15).

Productivity plus

Gil Gordon, a telecommuting analyst at Gil Gordon Associates in Monmouth, N.J., said, "There is definitely more telecommuting going on [today] than there was a year ago." He said this is due to a growing acceptance of the practice by companies as well as pressure from employees who want to work at home at least part-time.

"The interesting thing about what could happen in the wake of this storm is the conversation around the watercooler after everyone returns to the office. A lot of these people will say they got a lot of work done, which might open the eyes of some managers skeptical about productivity," Gordon said.

Gordon said smart managers will institute year-round work-at-home programs.

"If they look at telecommuting as only contingency or disaster recovery, then that is just waiting for the next disaster," he said.

In fact, many companies are already instituting long-term telecommuting policies, fueled by issues such as the pending federal Clean Air Act legislation, the strictures of the Family and Medical Leave Act and workers clamoring for quality of life improvements.

At Shiva Corp. in Burlington, Mass., a manufacturer of remote access products, 40 out of 200 employees telecommuted during the storm, according to Kathy Simonian, marketing and special events coordinator.

"Telecommuting is just part of our culture," she said. "Even the MIS people can work at home; they can troubleshoot with their laptops. We telecommute a lot here, whether it's nice out or not."

Companies also see benefits in reducing real estate costs and extending the workday for zealous employees, according to a recent report by Forrester Research, Inc. in Cambridge, Mass.

Helping the trend, according to telecommuting industry analysts, will be new high-speed digital phone lines and cable modems, which will utilize high-speed cable television connections.

Storm leaves phone lines snowed under

Telecommuting traffic alerts local carriers to need for faster connections

By Neal Weinberg

That fast busy signal you may have heard during last week's blizzard was the sound of local carriers creaking under an avalanche of calls. While the network didn't break, it did bend.

Offices up and down the eastern seaboard were deserted Monday, but residential telephone lines were hopping as snowbound workers dialed in to get messages, send electronic mail or log on to the Internet.

Lining up

Bell Atlantic has installed 140,000 ISDN lines in its service area. The company began rolling out a residential ISDN program in the fourth quarter of last year.

In Manhattan, the number of calls dropped from a Monday average of 22 million to just 12 million. But the call volume from the outer boroughs more than compensated, resulting in an overall 10% increase in telephone traffic in New York City alone, according to Nynex Corp.

Blocked calls

Call volumes in some residential areas soared between 30% and 60% above normal, according to Nynex. As a result, many callers simply could not get through the jammed circuits and ended up hearing the fast busy signal, which means the call has been blocked, or got the "all circuits are busy" recording.

Similarly, Bell Atlantic Corp. reported that blocked calls tripled last Monday from 1% to 3% of the 362 million calls dialed.

Telephone traffic

Not only were people on the phone, but they were also on the phone for longer periods of time, said Bell Atlantic spokesman Michel Daley. With 7.5 million home PCs sold in 1995 alone, according to Dataquest, Inc. in Santa Clara, Calif., and increased telecommuting due to the storm, one reason for the blockage may have been users logging in to work — and staying on.

There was a tendency for people to treat their cabin fever with a heavy dose of online connectivity, added Pat D'Innocenzo, product line manager for Integrated Services Digital Network (ISDN) services at Bell Atlantic.

He said the storm and resulting telecommuting blitz "opened a lot of people's eyes" to the need for faster connections to the office and the Internet.

Residential demand

But increased residential usage for telecommuting and Internet access could be a mixed blessing for local phone companies, which may not be geared up to handle blizzard-type demand on a regular basis — especially as telecommuting becomes more common.

Sanjay Mewada, an analyst at The Yankee Group in Boston, said the carriers will have to reconfigure and realign their networks to handle new patterns of traffic flow.

He said the storm "provided an opportunity for the carriers to see the kind of usage that will come into play once telecommuting and the home office environment become more widespread."

And Daley agreed that a boom in residential demand from telecommuters could create a network logjam unless Bell Atlantic takes action. The company may have to build more switches, install more trunk lines and generally rethink how it constructs networks, he said.

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NLMs to aid GroupWise mail links

Novell gateways pricey but effective

By Tim Ouellette

Novell, Inc. wants users to stack their GroupWise gateways in one box.

By adding support for two more NetWare Loadable Module (NLM) gateways to the GroupWise messaging and groupware system, Novell hopes to ease the cost and management burden of hooking GroupWise to other electronic-mail packages.

Groupware

Support now will be provided for exchanging mail with IBM's OfficeVision and SNA Distribution Services systems, though it won't be cheap (see chart).

While the other versions have been on the streets for a while, the Simple Mail Transfer Protocol (SMTP) NLM will soon add support for Multipurpose Internet Mail Extensions (MIME) so users can get a more accurate presentation of the attachment on the client side.

The NLMs, which reside on the NetWare file server, give GroupWise users one point of control for the gateway.

Exchange gets grabbed, but for E-mail, not its features. See page 49.

Greater capacity

Novell claims the NLMs can handle more messages at a time by taking advantage of the multithreading that NetWare provides. Mail gateways for GroupWise currently reside on separate servers, which can fall prey to lost connections and add another administrative layer to the system.

"The biggest [advantage] for us in speed," said Kevin Spousta, a LAN analyst at San Diego Data Processing Corp., a nonprofit government contractor that has 1,500 LAN users on GroupWise and expects to increase that number to 8,000 this year.

"When we went with the [SMTP] NLM, the delay for mail messages went from 2 minutes down to 9 seconds," he said.

"When the SMTP NLM became available, we switched right over from our OS/2 gateway," said Aaron Fessler, network operations manager at the Allegro Group, a Dayton, Ohio-based integrator and a GroupWise user.

In the long run, the NLMs can be cheaper because users can stack multiple NLM gateways in one box rather than maintaining a separate server for each gateway, Fessler said.

"Since GroupWise's sweet spot is NetWare users, consolidating their functions into an NLM is important," said Tim Sloane, an analyst at Aberdeen Group, Inc.

It also shows that Orem, Utah-based Novell is committed to GroupWise by providing a direct way to handle mail gateways instead of relying on in-house development or third-party products, Sloane added.

GroupWise opens the gate

These NetWare Loadable Module (NLM) gateways may help cut user costs and improve GroupWise's performance

NLM gateway/price	Use
[illegible]	To connect remote users with support for up to 32 modems
SMTP [illegible]	For Internet E-mail and MIME support due this quarter
[illegible]	To run GroupWise across an X.400 backbone
[illegible]	To exchange messages between GroupWise and IBM's OfficeVision/VM system
SNA [illegible] SNADS [illegible]	To exchange messages with IBM's SNADS mail-routing system for mainframes and minicomputers

Group seeks on-line gag

By Mitch Wagner

In the ongoing dispute over the boundaries of free speech on-line, a Jewish group last week asked for blocks against so-called "hate sites." Meanwhile, authorities investigated two separate on-line death threats against President Clinton.

The Simon Wiesenthal Center in Los Angeles called on hundreds of Internet service providers and on-line services to voluntarily block access to Internet sites set up by white supremacists and neo-Nazis. The letter went to major on-line services such as America Online (AOL), CompuServe, Prodigy and The Microsoft Network.

Some of the sites in question call on white Christians to "reclaim" the U.S. from Jews and nonwhites. Others espouse a more general anti-Semitic, anti-immigrant, pro-white agenda.

Decision pending

Officials at AOL and CompuServe said late last week that they hadn't yet received the letter and would reserve a decision until then.

Rabbi Marvin Heyer, dean of the center, said the organization is asking the on-line services to block the hate sites only when they couple angry rhetoric with explicit threats of violence. For example, he said, one site said, "It's time to kill the two Zionist pigs working in the White House."

Internet sites set up by hate groups, such as this one by the white-supremacist National Alliance, are coming under attack

"If these sites are engaged in hateful rhetoric with a call to violence, then we would like the providers to shut them down," Heyer said. "It is crossing a line and doesn't deserve the protection of the First Amendment."

Also last week, authorities were reportedly investigating two on-line death threats against President Clinton.

Brad Birnbaum, director of technical development at Interactive Marketing Services in Hauppauge, N.Y., said he was contacted by a Secret Service agent seeking information about death threats posted on Jan. 9 by a visitor to his firm's World Wide Web site. Last month, the White House home page received an electronically mailed death threat from Taiwan, according to American and Taiwanese press reports. As of late last week, authorities were still searching for the authors of both those threats.

Free speech on-line has been a hot issue in recent months. Congress continued in a deadlock last week over the Telecommunications Competition and Deregulation Act, which contains provisions blocking indecency on-line.

New caching tools speed up the Web. See page 67.

NT Internet firewall eases security woes

By Gary H. Anthes

Raptor Systems, Inc. in Waltham, Mass., this week will announce the first Internet firewall for Windows NT.

Beta users said the firewall, called Eagle NT, will allow them to establish secure Internet connections without having to master the complexities of Unix. Most companies' Internet connections have traditionally run on Unix.

A firewall employs user-specified rules to filter traffic between networks. It can block intrusions by hackers and enforce Internet-use policies that companies establish for their employees. It can also be used with encryption to establish "virtual private networks" over public networks for secure communications among corporate offices.

Firewalls have rapidly gained in popularity in recent years as companies connect their internal networks to the Internet.

The Harbor Branch Oceanographic Institution in Fort Pierce, Fla., has used Raptor's Unix-based firewall for several months but will scrap it in favor of the NT version. The institution uses the firewall to protect its campus-area network, which consists of some 200 PCs and several NT servers, said Robert Ruhge, computer services manager.

"We have just three people supporting all those computers, plus the Internet connection and our Web server," Ruhge said. "That's an awful lot. And for us to take on a new operating system like Unix is pushing us too far."

Ruhge said Harbor Branch had to set up the firewall when German hackers broke in to its system, replaced its password file and locked out its users.

Out with the old

The Waldec Group, a systems integrator in Tampa, Fla., will replace its Raptor Unix firewall with Eagle NT. Brooks Cutter, a senior systems integration professional, said that will give the company better operating system support and more third-party software.

Cutter also said NT is easier to maintain than Unix and inherently more secure because it is less complex. "Our customers want to connect to the Internet. They want to be secure, but they don't want to introduce Unix," he said.

Eagle NT will be available by late March and will cost $6,500 for 50 users, $11,000 for 200 users and $15,000 for unlimited use.

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ObjectStore tools offer graphical view

By Dan Richman

Three new tools are on tap for users of ObjectStore, the market-leading object-oriented database management system from Object Design, Inc. in Burlington, Mass.

The tools exemplify the trend among object database vendors to supply the graphical administration tools now typically found in more mainstream relational DBMSs.

"Object DBMSs really do allow high-powered apps. And tools like these, which have been missing for so long, are what will make [object] DBMSs more credible and pragmatic for general business," said Liz Barnett, a vice president at Giga Information Group, Inc., a Cambridge, Mass., research firm.

One new tool, ObjectStore Performance Expert, graphically depicts the database engine's activities. It helps developers refine applications so they consume fewer resources and allows database administrators to optimally configure a server. This application, which gathers data from both clients and servers, will sell for $6,000 per seat and will ship by the end of this month.

User John Cavicchio, a computer analyst at Ford Motor Co. in Dearborn, Mich., said ObjectStore Performance Expert sounds like it will be useful. "A lot of times we don't really know what the engine is doing. We've had to cobble together monitors under Unix," he said. "This sounds like it would be well worth the investment."

Databases

The second tool, ObjectStore Inspector, lets developers and database administrators view schemata, objects and classes. It provides a quick graphical overview of the structure and contents of one or more databases. That tool will sell for $800 on Windows and $1,300 on Unix and will ship in February. A version that shields users more completely from the complexities of querying is due by midyear.

The third tool, ObjectStore OpenAccess, will let end users access ObjectStore data from any tool complying with Microsoft Corp.'s Open Database Connectivity specification. ObjectStore data can be accessed only through C++ and Smalltalk.

Sorting software speeds data queries. See page 52.

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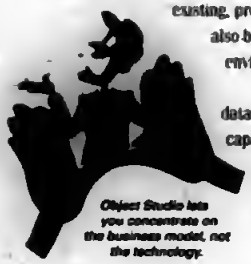

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Object Studio supports Microsoft's OLE2™, making it compatible with Microsoft's Windows 95™, Windows 3.1™ and Windows NT™. And Object Studio's clear, simple syntax and English-like commands make it the easiest OO language for COBOL developers to learn.

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Oracle will explore more of Rdb universe

By Dan Richman

Much to the relief of Rdb users, Oracle Corp. is about to acquire several key pieces of software from Digital Equipment Corp. that it left behind when it bought Digital's relational database management system in December 1994.

By the end of this month, Oracle will acquire Digital's Data Distributor, DB Integrator and the nine DB Integrator gateways to other vendors' database management systems and middleware, said two sources who requested anonymity.

"These tools form an important part of the universe for Rdb users like me. It was a big disappointment to me that they didn't go along with Rdb to Oracle," said Jeffrey Jalbert, president of JCC Consulting, Inc. in Granville, Ohio.

Don Novak, database manager at Navistar International Transportation Corp. in Chicago, said, "This removes a big question mark about the future viability of the software."

Between 20,000 and 25,000 companies are licensed to use Oracle's relational database management system, and about 1.5 million people use it worldwide.

Oracle delivers only silence about its Internet appliance. See page 41.

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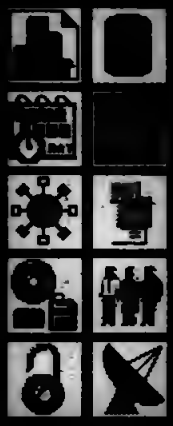

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IBM reprices 'net access costs to lure users

By Bob Wallace

In an effort to turn up the heat on smaller Internet access providers, IBM has outlined three new pricing plans for its Internet access services and slashed the cost of a related desktop software package.

The pricing plans are aimed at providing users with low-cost access to the vast resources of the Internet using IBM's Global Network, an established value-added network [CW, Jan. 8].

IBM's Internet access service, called The Internet Connection, has a monthly charge that ranges from $4.95 to $29.95. It is available through more than 350 local network entry points in the U.S. and supports dial-up links in many areas at 28.8K bit/sec.

The presence of the computer giant in this fast-growing segment may be a comfort to users who are wary of relying on small Internet access providers.

"I don't think the smaller ones will last," said John Holton, vice president of Applications Profile, Inc., an employment services company in St. Petersburg, Fla. "The big boys like IBM and AT&T will be able to offer lower prices that the small providers can't match. The small guys will get squashed."

Vanishing players

Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J., agreed. "There's going to be a huge amount of consolidation in the Internet access service provider market, with about 70% of these companies vanishing by this time next year," he said. "Only the big players like IBM will be able to offer low-priced Internet access for the long haul."

Though some Internet service providers offer access via higher-bandwidth Integrated Services Digital Network (ISDN) Basic Rate Interface links, analysts say that is the exception rather than the rule.

> "The small [Internet access] guys will get squashed."
> —John Holton, vice president, Applications Profile

"ISDN access is not widely available now, but it will be much more a year from now," Briere said.

IBM's Entry Plan costs $4.95 a month and includes three free hours, with each additional hour priced at $2.50. The new Standard Plan costs $12.95 a month and includes 10 free hours, with each additional hour priced at $1.95.

For more demanding end users, IBM offers the Comprehensive Plan, which costs $29.95 a month and includes 30 free hours. Each additional hour costs $1.95.

"These prices are pretty competitive with what smaller [Internet service providers] are offering," Briere said. "But the larger ones seem to be focusing their attention on higher-bandwidth access pipes for corporations, universities and the research community. We're talking T1 speeds and above."

IBM also turned its attention to the desktop and slashed the price of the IBM Internet Connection Version 4.0 for Windows from $59 to $25 for a promotional period of unspecified duration.

Additionally, IBM has launched a corporate dial-up service that uses the company's global network. It lets travelers access applications that reside in TCP/IP hosts linked to the Internet.

The service comes with the Internet Connection Corporate Access Kit, which contains a dialer, TCP/IP software, an Internet mail client and a World Wide Web browser.

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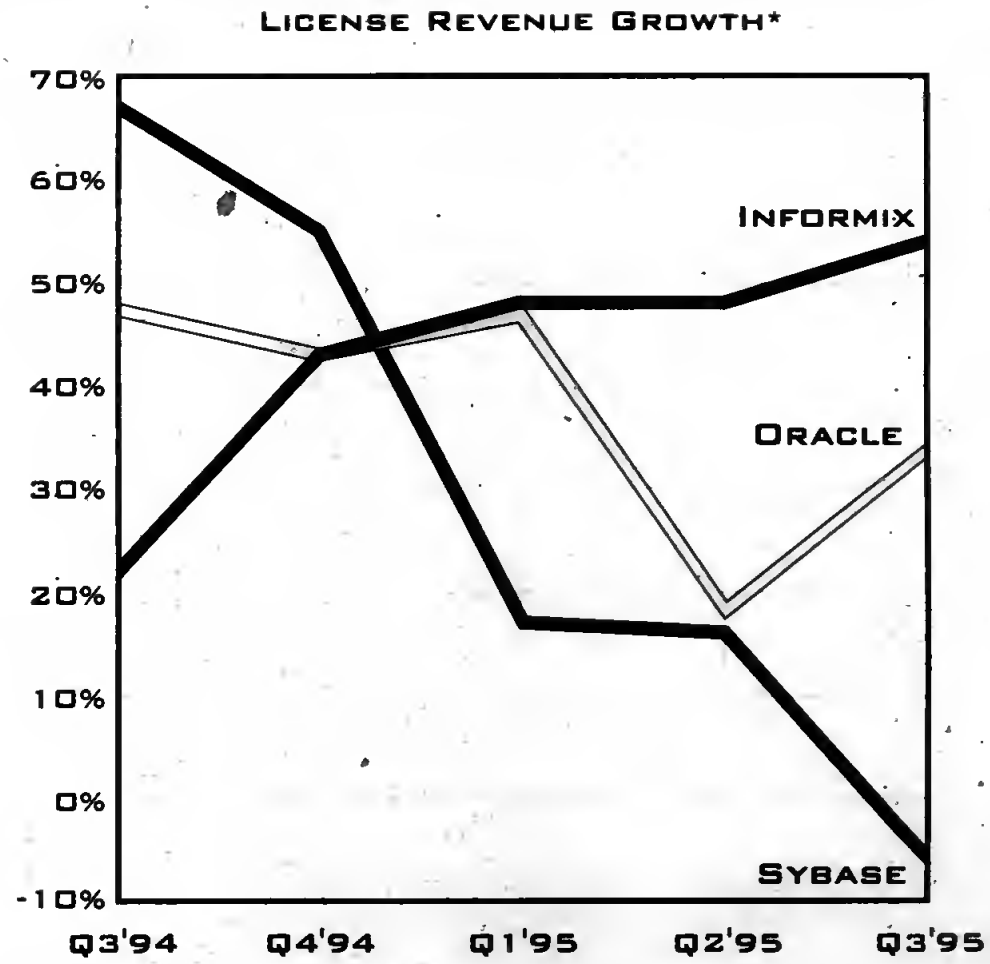

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WHAT THE BIG GUYS USE

Big iron's big change

IBM makes the mainframe less expensive and more in tune with today's client/server technology

April: IBM's CMOS-based System/390 is introduced along with revamped software pricing and parallel clustering technology

May: Plans disclosed for building object technology into MVS

1994

September: General-purpose versions of CMOS-based mainframes released

December: OpenEdition MVS ships with a Unix look and feel and support for Posix and DCE

March: C/C++ for MVS ships

May: PC server/mainframe hybrid introduced for application development and low-end processing

June: Second-generation CMOS processors are introduced; SOMobjects for MVS object request broker ships

1995

September: MVS 5.2.2 released with expanded OpenEdition MVS and built-in object class library

October: Object-based Cobol released for MVS; plan announced for bundling MVS with supporting products to ease installation

December: Limited shipment of SOMobjects for MVS Release 2.0 with support for distributed objects; MVS receives base XPG4 branding as an open system

Big iron gets second life

CONTINUED FROM COVER 1

turning to the dire days when System/390s were about to be turned off and tuned out. The rest of this decade should be an especially happy period for mainframe believers.

Market watchers Meta Group, Inc. and International Data Corp predict that MIPS shipments will increase by 40% or more in the next five years. That is a stunning turnaround from 1990 to 1993, when anemic growth gave way to outright declines in shipments.

The change can be chalked up to a backlash against the cost, complexity and immaturity of client/server technology. Another important factor is the difficulty of separating key corporate data from mother mainframe.

"Reality has set back in to the equation. People just can't get off of these things," said Carl Greiner, an analyst at Meta Group in Stamford, Conn.

"It's not going away easy," agreed Richard Witkowski, director of information systems at Niagara Falls Memorial Medical Center in Niagara Falls, N.Y. The hospital stopped developing for the mainframe and is moving applications to PC networks. But transactions against its mainframe jumped almost 25% in the past 18 months because patient data remains firmly ensconced there.

Ed Miller, director of technology management at the Allegheny Health Education and Research Foundation in Pittsburgh, said his company's mainframe capacity needs will double in the next two years. That is due to the creation of a lifetime clinical records database for patients at the five hospitals Allegheny Health owns.

Patient records are moving to the mainframe from a mix of old minicomputers. Allegheny has gone to Unix for some applications, but the mainframe "is probably the best fit right now" for the records because of the amount of data involved, Miller said.

Running out of gas?

But while the client/server tide isn't washing over the mainframe seawall, it is inexorably lapping away at the underpinnings. Greiner said annual spending on high-end Unix and Windows NT servers should surpass System/390 purchases sometime after the turn of the century.

The mainframe boom also is getting a lot of its fuel from sources that may be shortlived. Companies that haven't upgraded their mainframes in years are buying IBM's new CMOS-based System/390s purely to lower operating and maintenance costs. Year 2000 application conversions also are expected to be big capacity hogs but, by their very nature, temporary ones.

As those peter out, something will have to take their place. New applications that put mainframes front and center in client/server environments are the obvious choice. But even self-proclaimed mainframe bigots aren't convinced that will happen on a widespread basis.

Only about 5% of the more than 500 users at Gartner Group, Inc.'s data center conference last month raised their hands when asked if their companies plan major new application development for the mainframe. "When you get that kind of response, it's pretty frightening," said Charlie Burns, a Gartner analyst in Stamford, Conn.

A piece of the pie

IBM is trying to carve out a client/server place for System/390s (see timeline at left). It also is lobbying Unix software vendors to support mainframes. More than 450 companies have joined a System/390 developers association, including SAP AG, which is porting its popular R/3 client/server software to the mainframe. Oracle Corp. reportedly is close to finishing a new MVS release of its database that removes past performance bottlenecks.

Some users indeed are anointing big iron as a platform for more than just legacy applications. "We've come a long way toward being able to put a mainframe in a network," said Carl Gerberich, vice president of information services at Marist College in Poughkeepsie, N.Y. Marist is prototyping a DB2-based digital library for on-line teaching (see story at right).

But many other companies aren't buying — at least not yet.

"We have five or six very large legacy applications that will never go client/server," said Wayne Wallace, data center manager at Washington Mutual Savings Bank in Seattle. Nonetheless, the bank's investment stream is "dramatically skewed" toward Unix systems and LANs, he added.

Mainframe shops that want to buy packaged client/server applications also are being pushed toward Unix and Windows NT. "That seems to be where all the development is for those products," said Frank Vrtar, manager of technical support at Weirton Steel Corp. in Weirton, W. Va. The steelmaker is considering dropping its mainframe-based financial and human resources systems in favor of packaged software.

User departments usually call the application shots these days, and persuading them to give the mainframe a chance may be tough.

Barnett Banks, Inc. in Jacksonville, Fla., is installing the client/server-oriented MVS 5.2.2 that IBM shipped last fall. But its Unix-happy departments are skeptics until proved otherwise, said Michael Puldy, manager of resource management at the bank.

"Business just doesn't wait for these things to happen," Puldy said. "There are so many things in flight already here. Maybe [the mainframe] will be a last resort if things don't work out elsewhere."

The NSF overhauls its supercomputer program, page 41.

Debunking the client/server cure-all

Who needs client/server anyway? Not GTE Corp.'s telephone operations; it just junked a planned Unix-based customer service system and instead will put a Windows-like interface on an existing mainframe application.

"Our strategy was 100% client/server," said Arnie Lambers, manager of information technology asset management at GTE's operations unit in Tampa, Fla. "In fact, we were going to start pulling things off the mainframe. But it turns out that some of those mainframe applications weren't that bad."

Like many before it, GTE also ran into development delays and higher-than-expected costs on the client/server project, which was built around Hewlett-Packard Co. hardware.

The company hopes its overhaul of its mainframe-based customer service application will be finished in the second or third quarter, Lambers said.

Marist College also found automated new platforms wanting for a digital library application that went into limited use this academic year.

"Some of the early tests were on smaller systems, and they didn't fit the bill," said Harry Williams, manager of programming at the school. Marist instead returned to its mainframe and is "looking at scaling up a lot faster than we could have done otherwise," he said. — Craig Stedman

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Computer Industry

Briefs

Back to the future for NCR Corp.
AT&T Global Information Solutions isn't the former NCR Corp. anymore. It is NCR once again — effective immediately. As part of AT&T's breakup into three independent companies, the GIS computer unit is no longer allowed to use the AT&T name. The NCR name dates back to 1884 and will be revived because of its widespread recognition. AT&T spent more than $5 million to change the name on buildings and several more millions of dollars to change product logos.

Amdahl names executives
Amdahl Corp. named two executive vice presidents who will take over much of the company's day-to-day management responsibility from president and CEO Joseph Zwaska. The Sunnyvale, Calif., company combined its mainframe-related operations into a single unit headed by David Wright, who had been running sales and service. Amdahl also created a new Operating Council that will be overseen by Bruce Ryan, who is the firm's chief financial officer.

SHORT TAKES BSG, a client/server systems integrator in Houston, last week acquired integrator Ernst Systems, Inc. in Minneapolis. ... Dallas-based outsourcer and information technology service provider Affiliated Computer Services, Inc. is acquiring The LAN Co., a networking and document management specialist in Philadelphia. ... Seagate Technology, Inc. has agreed to buy the minority interest of Arnada Software, Inc., a majority-owned subsidiary of Conner Peripherals, Inc. Seagate and Conner previously had agreed to merge.

Tandem's new CEO opens up

Roel Pieper vows to take proprietary systems to new platforms

By Michael Goldberg

Roel Pieper, the new president and CEO of Tandem Computers, Inc., last week pledged to make the company's historically proprietary technology part of as many computer systems as possible.

Roel Pieper: *We want to bring more of Tandem to more partners and more users*

Pieper formerly headed up Tandem subsidiary UB Networks, Inc. He was appointed Jan. 8 to succeed Tandem founder James Treybig.

Pieper is succeeded by Christopher Brennan, who was chief operating officer at UB Networks and assumes the titles of president and chief operating officer.

Pieper said one of his early goals is to seek more deals like the firm's October pact with Compaq Computer Corp. to use Tandem's ServerNet technology to build low-latency clusters of Compaq servers [CW, Oct. 23].

He said the company is ready to open up to other platforms. "We want to bring more of Tandem to more partners and more users," Pieper said.

Following a strategy laid out under Treybig, Pieper said he will be more aggressive in pursuing new partners for Tandem's software and hardware.

But he spelled out few specifics beyond a desire to invest more in marketing and boosting Tandem's image.

Users and analysts said Pieper needs to do what has so far eluded Tandem: significantly enlarge the consumer base for the firm's technology.

Bill Honaker, president of the International Tandem Users Group, said moving the vendor's technology into new markets would benefit users. "If Tandem is successful, they can better support the customer base" with a broader set of offerings, he said.

And raising Tandem's profile could help IS managers win corporate support for new equipment purchases, Honaker added. He is a partner at XID Software, Inc. in Euless, Texas.

Making markets

Despite such suggestions, George Weiss, an analyst at Gartner Group, Inc. in Stamford, Conn., cautioned, "You don't make markets out of technology." He noted that while Tandem may have good I/O and clustering technology with ServerNet, it may have an industry lead for only six or 12 months — not enough time, necessarily, to spur a major turnaround.

"ServerNet means nothing unless it is related specifically to issues that software and applications can solve" for users, Weiss said.

Pieper, 39, was president of UB Networks for the past two years. Previously, he headed up Unix Systems Laboratories, the former AT&T Corp. unit that merged with Novell, Inc. in 1992.

Express data

Tandem's ServerNet uses hardware and software to act as an express train for data that doesn't require CPU processing. By early 1997, Compaq plans to produce low-latency clusters of PC servers that use Peripheral Component Interconnect cards with ServerNet technology.

CIOs getting more respect — and higher salaries

By Tim Ouellette

Big business is starting to treat chief information officers as part of the gang.

Larger corporations are paying CIOs more than $200,000 on average for the first time, according to a survey by Positive Support Review, Inc.

"More and more CIOs are becoming part of the management team," said Victor Janulaitis, CEO of Positive Support Review. "It is no longer a service function; it is more part of the operating group in a corporation."

Total compensation includes supplemental compensation, such as stock options, education and time off.

For companies with sales of less than $500 million, the mean total compensation package was $141,000. Salaries rose faster in this category, though, as growing companies displayed a willingness to pay more for the skills they needed.

"Corporations have identified that technology can give them a competitive advantage," said John Hodge, CIO at NAC Reinsurance Corp. in Greenwich, Conn.

This leads to more dependence on the CIO to plan for the use of technology. And not using technology to its potential could be a serious competitive disadvantage to many firms, Hodge said.

"We used to be custodians of electronic data. Now we are offering an integration strategy with fax, paper and voice data for a single source of information for the company," said Lawrence DeBlasiis, CIO at Life Reassurance Corp. of America in Stamford, Conn.

With the improvement in the overall economy and explosion of the high-technology market in the past year, IS positions reflect salary improvements from 1994, according to the survey.

Like the CIO position, other jobs had widely varying salaries in some cases, depending on the size of the company (see chart).

Results from the 1994 survey showed that the lingering recession held back base salaries for CIOs. Firms also tied a lot of the total compensation package to company performance.

That changed a bit in 1995.

"Today, it is more standard for CIOs to have an employment contract," Janulaitis said. This usually includes provisions for a "golden parachute" in case of corporate buyouts or mergers, for example.

Contracts now also include more stock options, mirroring the success of high-technology shares on Wall Street.

Such provisions can propel some CIO salaries to levels not seen before.

"I know of several CIOs who are almost into seven figures for their total compensation package," Janulaitis said.

Positive Support Review, a market research and consulting company in Santa Monica, Calif., received responses from 105 companies and more than 10,000 IS employees.

Similar to Positive Support Review's results, *Computerworld*'s salary survey [CW, Sept. 24] showed a significant salary spread between large and small companies, sometimes up to $55,000. Base salary growth also was strong among all IS positions surveyed.

We're in the money

Total compensation ranges for selected IS management jobs

Title	Small firms*	Large firms**
Chief information officer	$76,140 to $205,200	$110,000 to $292,575
Data center manager	$49,188 to $64,991	$59,438 to $96,690
Hardware installation coordinator	$52,600 to $69,000	$56,770 to $71,300
Manager, network services	$47,925 to $89,000	$50,000 to $75,449

*Less than $500 million in sales **More than $500 million in sales

Source: Positive Support Review, Inc., Santa Monica, Calif.

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21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys., Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Sys.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D. Tech. Mgt.
80. Sys. Integrators/VARs/Consulting Mgt.

CORPORATE MANAGEMENT

11. President, Owner/Partner, General Mgr
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

DEPARTMENTAL MANAGEMENT

51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

OTHER PROFESSIONAL MANAGEMENT

80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems

(a) Solaris	(e) Mac OS
(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

App. Development Products ❑ Yes ❑ No

Networking Products ❑ Yes ❑ No

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23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D. Tech. Mgt.
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80. Information Centers/Libraries, Educators, Journalists, Students
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(b) Netware	(f) Windows NT
(c) OS/2	(g) Windows
(d) Unix	(h) NeXTstep

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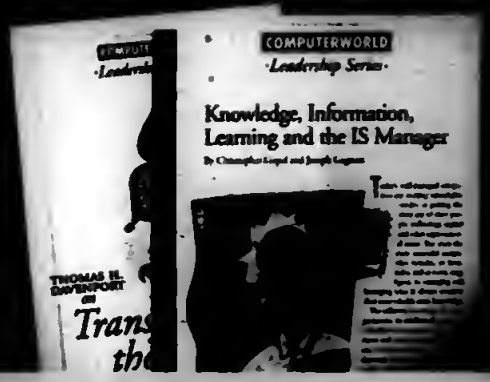

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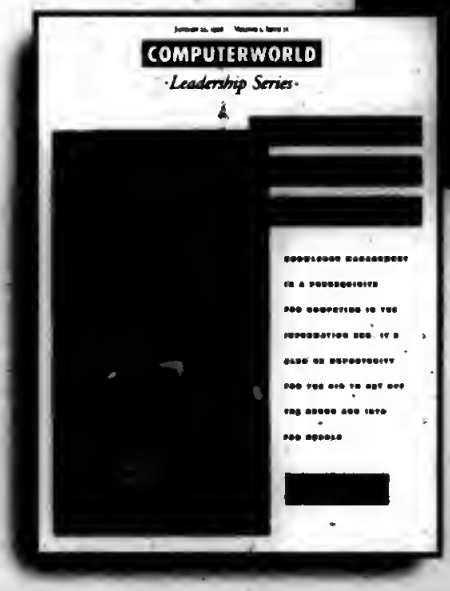

Coming in the January 22nd issue of Computerworld

Today more than ever, corporate leaders must adopt new approaches to align information technology strategies with those of the overall organization. Simply using information technology to cut costs is no longer sufficient. It must be used to improve performance. In this month's Leadership Series article, authors Harry M. Lasker and David P. Norton discuss how IT can be used as a tool for creating and managing knowledge. Their recipe demands a new collaborative relationship between the CEO and CIO — one that brings the CIO into the inner circle.

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Lotus

A Web page worth the wait

In the past several months, we've taken some grief for not having a presence on the Web. Alas, we had no home page.

[redacted]t can you remember the first airline to introduce a [redacted]quent fl[redacted]r program? Neither can I. Yet you can probably name your favorite frequent flier program.

We've been carefully scrutinizing the "other" home pages for some time as we planned the launch of our own. Last week, we launched @Computerworld (www.computerworld.com), the goal of which is to be the finest source of on-line information for the IS community.

What makes it different? For starters, we opened the site three months ago to 500 beta users, and the input they provided has been invaluable. As a result, we're building features such as the following into our Web site:

[redacted]

QuickPolls: A polling device that consists of five yes/no questions devoted to a specific topic or news event. The questions will be updated each week, and a thermometer on the home page will indicate how hot the poll is, based on how many votes are tabulated.

Computerworld Digest: An interactive index page, similar to Harper's Index, which lists industry facts in a stream-of-conciousness association. In our index, the facts will provide hypertext links to information sources on the Web.

Forums: We will provide interactive forums that focus on breaking news as well as specific topics (whiteboards). Whiteboard forums will also provide a new idea for on-line columns in that a thread will be attached to the column.

Search: Our Search capability will involve two of the best search engines in the industry. Architext will provide a concept-based — not simple keyword — search engine to find stories from *Computerworld* the newspaper, *Computerworld Client/Server Journal* and @Computerworld. We also share a reciprocal link with the Yahoo site.

Nothing will be more valuable to us in the beginning than your feedback. So fire up @Computerworld, and let us know what you think.

Bill Laberis

Bill Laberis, *Editor*
Internet: *bill_laberis@cw.com*

[redacted]

Education is key

I do see the problem as Marc Gunderson does about our growing dependency on silicon gadgetry ["We're losing our creative minds," CW, Dec. 4]. It's not because of silicon, but because the brain creators and politicians are making the life out of education. The solution isn't less silicon, but ... more interactive learning stations to teach the tools rapidly, thus giving the students more time to have adventures with creative teachers, using these tools to produce something meaningful. Students get in trouble with graffiti, drugs, immorality and gangs because they haven't been taught or given tools and opportunities for expression.

And the solution isn't just a bigger educational technology budget, but a renaissance that frees and inspires education, includes business partners or parents and teams up students with them in creative production — and then recognizes their achievements.

Darish Nordstrom
Hollister, Calif.
nordstrom@garlic.com

A misguided guru

Regarding "Conversation with Tom DeMarco" [CW, Dec. 4], it's nice to see that other professions also have their misguided gurus. The surprise isn't that companies such as Microsoft have stopped calling DeMarco. One has to wonder why they started calling in the first place.

That "great managers are mostly born" is just psychobabble — leaders in the heroic sense may be born, but managers can be developed and trained. If DeMarco doesn't understand that there is a great difference between managers and leaders, there's simply no hope for him.

Any fair-minded person would take issue with some of coach [Vince] Lombardi's tactics. But I have never heard an athlete who played for the coach speak ill of him. They loved him and vice versa. He demanded excellence and obtained it in spades from a group of athletes not nearly as talented as many of their opponents. But Lombardi brought the best out of them for their contests, as great managers/coaches will.

As DeMarco says, there is a germ of truth in many things. His interview responses are a living testimony to the germ theory.

James F. Fitzgerald
Naperville, Ill.

Word wasn't shock

I just had to respond to Michael Robinette's letter regarding your supposed use of profanity ["Shock headline," CW, Dec. 26/Jan. 1]. It is certainly one of the silliest letters I've seen printed in *Computerworld*.

Your use of the word "hell" was intended to amuse, rather than shock, your audience. Humor is entirely appropriate in a business publication, as evidenced by the cartoons in all sorts of serious publications.

In addition, I feel quite certain that your use of the word "hell" is not evidence of the decline of our great country, family values, etc. Nor do I expect your use of "profanity" to escalate. With all due respect to Robinette and his highly developed sensibility, it's people like him that give us Baptists a bad name.

Heather L. White
Bedford, Texas

Service lacking

Recent issues of *Computerworld* have noted that major long-distance carriers and local phone companies want to expand into one another's markets as well as venture into new technologies such as interactive television and Internet access.

What I would *really* like is for these companies to execute their current offerings with at least some minimal level of proficiency. Our local carrier has managed to drop our main data T1 line at our headquarters every time it has been on site over the past year. Aside from that, it takes at least two trips to get anything right, as the service orders invariably have some error, which causes the installer to schedule another trip.

I have no idea how these companies expect to offer any new services if they can't even install a simple Integrated Services Digital Network or T1 line.

Paul J. Lourd
UST, Inc
Greenwich, Conn.
lourd@pop01.ny.us.ibm.net

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

Verbatim

Excerpts from an interview with Microsoft chieftain Bill Gates, conducted by Computerworld Hong Kong:

Q: I gather you're not particularly impressed with Netscape [Communications Corp.].

Gates: Oh, they're very good people. But there is such a thing as an overreaction in this world.

Q: Was there anything that you really wanted and expected to get into Windows 95 but had to leave out in order to ship it on time in August?

Gates: Infinite speed — we had to leave that out.

Q: There must be some trend or development that's occurred over the past 20 years that you would never have expected. What caught you by surprise?

Gates: Kaleida and Taligent had less impact than we expected. There are certainly things like handwriting [recognition on] computers — we thought we could . . . make that successful, and it as yet has amounted to nothing.

RISC processors have had less impact than we expected. [Personal digital assistants] I expected to be more successful. But I still believe they will be, so we're investing very heavily in that. Someday it will happen — in my book, I talk about the so-called "wallet PC." Everything we're doing today is sort of a precursor to that.

From a report by Josh Bernoff, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.:

Brand managers complain about the agencies' lack of in-house Web expertise. Fifty-one percent of the brand managers interviewed for the report had implemented their Web strategies without ad agency help — depending instead on Web service providers [such as] Digital Planet and Organic Online.

Unless agencies pick up technical talent, they will lose the opportunity. As more consumers move online, established [advertising] agencies that can't finesse the Web will be displaced.

Microsoft endangers TCP/IP standard

John Davidson

Memo to the U.S. Department of Justice:

TCP/IP has played an essential role in the proliferation of government, university and business internetworks. It also is the standard for linking to the Internet. Dozens of network operators, Internet access providers and networking vendors rely on robust and innovative implementations of TCP/IP software to create efficient, flexible and scalable internetworks.

Bundling TCP/IP with Windows 95 may give Microsoft control over the networking standard.

However, Microsoft's bundling of a TCP/IP protocol stack with its Windows 95 operating system is a direct threat to the source of innovative TCP/IP implementations.

Rather than compete against Microsoft's "free" software, many independent TCP/IP vendors already have shifted development away from new TCP/IP implementations and are focusing on higher-level applications.

As a result, only a handful of TCP/IP systems for Windows 95 are under review by the WinSock Interoperability Lab. This lab tests implementations of the Windows Sockets application programming interface (API), which is used by communications software to make operating system calls. (Normally, dozens of TCP/IP vendors submit systems for testing when a new operating system is introduced.)

As competition in the TCP/IP arena is squelched, the TCP/IP standard will become whatever Microsoft wants it to be. This "public" standard will, in fact, become a proprietary protocol manipulated by a single vendor with the power to inhibit its progress and harass competitors to its own advantage.

Against their will

This will force application developers and hardware suppliers into the Microsoft camp. Microsoft already owns the operating system on most desktops. By controlling the API for Windows 95, Microsoft has the power to co-opt any application area it chooses — to the detriment of competing application providers and, ultimately, end users. Control over the TCP/IP protocol and its API could place network connectivity in Microsoft's hands as well.

For example, a new telephone modem to provide home users with Integrated Services Digital Network access to the Internet requires a great deal of supporting TCP/IP software. Few, if any, modem suppliers can afford to commit the resources and development time necessary to design this software from scratch, so they rely on independent developers.

If these developers are squeezed out of the market, Microsoft will be the only source of TCP/IP software. Microsoft has little incentive to support a modem supplier that doesn't promote Microsoft products and marketing objectives.

If an independent TCP/IP software vendor does survive, that vendor will have to provide a superset of Microsoft's interfaces and services — some of which are proprietary and completely under Microsoft's control. The modem supplier will pay a high price for this software and will remain vulnerable to Microsoft's whims and preferences.

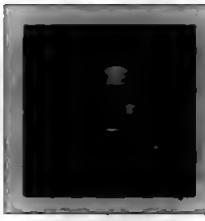
This isn't just a matter of free vs. priced software. There's nothing wrong with Microsoft offering TCP/IP software free of charge, as long as it isn't bundled with Windows 95 and must be specifically acquired by the user. Users can then evaluate and compare competing packages, including TCP/IP software bundled with browsers and on-line services from Microsoft competitors.

Davidson is president of Network TeleSystems, Inc., a developer of TCP/IP-based systems in Sunnyvale, Calif. This article is a summary of information he provided to the Justice Department last year.

Back to thin clients, fat servers

Max D. Hopper

When the advent of the network-centric model is promoted by technology leaders, two things happen. First, the often theological controversy of mainframe-centric vs. desktop-centric approaches becomes irrelevant.



Oops. The new trend is to put the computing power on the network, not on the desktop.

Second, we discover that our decade-long effort to place more computing power on users' desktops may have to be at least partially reversed. With network-centric computing, users pluck portions of operating systems and application software from the network — not the desktop PC — on an as-needed basis.

To the extent that our networks enable workers to access anything, anywhere, any time, workers no longer need everything, everywhere, all the time. Yet, ironically, that's the level of capability we have been straining our wits and our IS budgets to provide to the workforce.

Today, many corporate users have PCs with the power of a mid-'80s mainframe, and they often use them for nothing more taxing than word processing or E-mail. In fact, studies show that the typical PC is used to only about 17% capacity. While that's more than the 10% average humans are reputed to use of their brain's capacity, we can hardly consider it efficient.

Yet after several hardware and software upgrade cycles, the steady escalation of desktop capabilities has, in many cases, reached the point of overkill. IS managers are beginning to wonder if an Intel Pentium-based PC running Windows 95 might be like using a sledgehammer to swat flies.

The latest industry buzz indicates a growing interest in more appropriately scaled technology. We're hearing terms such as "thin clients," "shell PCs" and "information appliances" to describe a variety of simple, low-cost I/O devices that will meet the needs of many users.

The network-centric model implies large, centralized repositories and a partial reversal of the trend to broadly distribute data and processing capabilities to smaller local servers and desktop systems. But that's not to suggest that all client devices will be leaner. As with servers, we'll need a broad range of client machines, each scaled to users' needs, and some of these will be even fatter than today's high-end PC.

Fueled by the Internet's ubiquitous access and low communications costs, the thin client/big centralized server model makes a lot of sense as a more efficient allocation of IS resources. And as this strategy gathers steam, it should significantly reduce IS expenditures in the long run.

While the promise is great, we've yet to create the infrastructure for a network-centric environment. We'll need more network bandwidth to support the increased traffic and more thoroughly integrated systems for top-to-bottom interoperability. We'll also need new development tools and improved application designs to enable more extensive deployment of objects, applets and agents.

Ultimately, the network-centric model will employ the client/server concept in its fullest sense: networked devices of every size that work in harmony to efficiently produce the desired result. Of course, we'll get there sooner if we can make the conceptual shift from networks that orbit around a specific platform to networks that fulfill our IS objective of cost-effective access to information and relevant computing capabilities.

Hopper, former chairman of AMR Corp.'s Sabre Group, is principal at Max D. Hopper Associates, Inc., a consultancy in Dallas.

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NEW PRODUCTS, 45

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A fight for survival

By Gary H. Anthes

As the NSF restructures its supercomputer program, four facilities face uncertain future

Four of the nation's most advanced computer facilities are fighting for survival in the wake of a recent decision by the National Science Foundation (NSF) to restructure its supercomputer program.

The supercomputer facilities are the Cornell Theory Center at Cornell University, the National Center for Supercomputer Applications at the University of Illinois, the San Diego Supercomputer Center at the University of California, and the Pittsburgh Supercomputer Center at Carnegie Mellon University and the University of Pittsburgh.

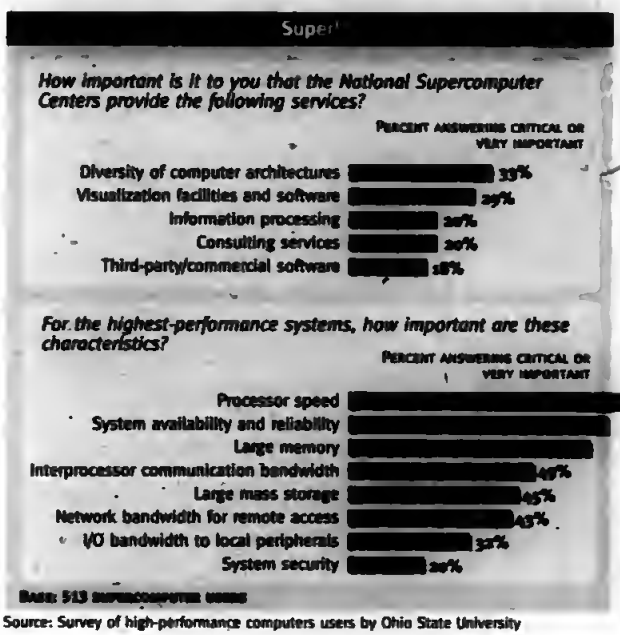
The centers were established in 1986 with 50% funding from the NSF to help solve the so-called grand challenges of science. These include global climate modeling, microelectronics circuit design and drug design.

The NSF said it will award "one or more" new contracts in February 1997 to "partnerships" consisting of a high-performance computer center allied with universities, national laboratories, research consortia or corporations.

"A partnership would be connected by a high-bandwidth network," said Robert Borchers, director of the Division of Advanced Scientific Computing at the NSF.

The partners would be "a leading-edge center with the big iron" and three to six other entities that might have expertise such as computational chemistry or parallel computing, he said.

"It's a big experiment, actually, trying to take advantage of scalability and networking to get broader coverage," Borchers added.



Source: Survey of high-performance computers users by Ohio State University

Which will survive?

Borchers said budget realities make it unlikely that all four centers will get renewed funding. However, two centers might team, one with big iron and the other with people only, he said. He said corporations might be included as partners.

Jay Blaire, deputy director of the Cornell center, said he doubted it could survive without its 50% funding from the NSF. About 2,000 users a year log on to the center's 512-processor IBM SP2 supercomputer, which Blaire said is the fastest general-purpose computer in the world.

NSF, page 45

Tale of the tape: Telex may win race

By Craig Stedman

IBM may have been the first mainframe tape drive vendor to promise built-in support for stacking multiple data sets on a single cartridge. But Memorex Telex Corp. is expected to deliver it first.

Memorex Telex officials confirmed this month that they hope to introduce a "virtual volumes" feature for the company's new Sultan 5600 tape library in the second or third quarter of this year.

The ability to stack multiple data sets on a cartridge should help mainframe shops fill a higher percentage of their tapes. Stacking can already be done through a mainframe-controlled process, but that eats up CPU cycles and requires manual steps that would be automated if tape drives took over the work.

IBM originally promised to build stacking support into its Magstar tape drive by late last year, later amending that to the middle of this year. But the mainframe version of Magstar recently was delayed until the end of this year, and the stacking feature isn't scheduled to become available un-

Telex, page 45

Oracle mum on new device

By Elinor Mills

Will the $500 Internet appliance ever really exist?

Oracle Corp. officials say yes, and we will get a glimpse of it before the end of March.

But the company is putting forward no details. Secrecy "is our intention," said Andy Laursen, vice president of network computing at Oracle in Redwood Shores, Calif. "We're essentially starting a new industry, so we're doing a lot of heavy negotiations with a large cross-section of companies. We're not ready to show our hand until we have all the deals in place."

Laursen promised that Oracle will demonstrate systems "at a big, splashy event sometime in the first quarter of this year."

Oracle executives, including Chairman and CEO Larry Ellison, are confident about their pending product. Skeptics speculated the product could turn into vaporware, but Laursen insisted the product is real.

During a keynote speech at an International Data Corp. conference in Paris in September, Ellison first mentioned a device that would offer Internet access but store most of the software on a network, thus eliminating the need for much memory or computing power at the user's end.

The Internet

Oracle may have competition because other companies have entered the debate.

Apple Computer, Inc. executives point to their Pippin technology, which runs a version of the Macintosh operating system, as the progenitor of a low-cost Internet appliance.

Meanwhile, Eric Schmidt, chief technical officer at Sun Microsystems, Inc., said Sun has been working on a prototype of a network device. Moreover, Sun executives have positioned Java, an object-oriented application development environment for the World Wide Web, as an ideal application for the device's use.

But Sun matches Oracle in terms of secrecy on its product plans.

"We haven't committed to producing a device on any specific date," a Sun spokesman said, adding that the company has instead "committed to the idea." Sun's device would be targeted at corporate rather than home users.

Mills is a U.S. correspondent for the IDG News Service

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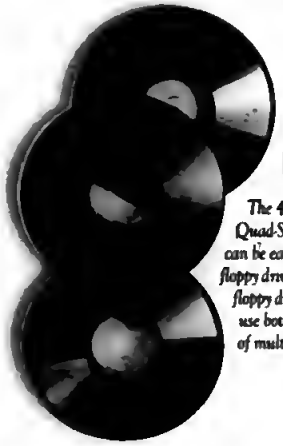

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Telex

CONTINUED FROM PAGE 41

til the first half of 1997

Troy Eiland, director of enterprise network storage at Memorex Telex in Irving, Texas, declined to comment in detail on the virtual-volume project, code-named Scimitar.

However, he said the technology that Memorex Telex is developing "can be packaged in several ways." Among the potential options is a separate box that could connect to a library and mimic a tape drive while actually containing disks or memory for faster access to frequently used data.

Memorex Telex lags far behind market leader Storage Technology Corp. and second-place IBM in mainframe tape drive shipments, according to International Data Corp. (IDC) in Framingham, Mass. The company's market share is in the 5% range, and it was surpassed by Hitachi Ltd. for third place in 1994.

"They're best described as kind of holding their own," said Robert Gray, an analyst at IDC. But he said that being first to market with virtual tape could help Memorex Telex put some momentum behind the Sultan 5600 library, which is scheduled for volume shipments in March.

Nick Allen, an analyst at Gartner Group, Inc. in Stamford, Conn., said the number of calls he gets from clients about Memorex Telex has increased sharply since Sultan was introduced last fall. The first hints about Scimitar began to emerge then too.

Sultan of terabytes

Sultan, which is in beta testing now, can store up to 116T bytes of data on nearly 49,000 3480/3490 cartridges. That is three times what Memorex Telex's existing 5400 libraries can hold. Sultan also is supposed to provide 30% more tape mounts per hour because of a redesigned cartridge carousel.

Union Bank in Monterey Park, Calif., is using three 5400 libraries with a total capacity of about 11,000 cartridges. The bank has potential future interest in the volume-stacking capability, although it already uses its mainframe to put multiple data sets on cartridges, said Jerry Sorensen, vice president of data processing services.

NSF

CONTINUED FROM PAGE 41

Could the Pittsburgh center survive without government funding? "It's not possible to say at the moment. It would certainly be a serious loss," said Ralph Roskies, scientific co-director at the center. Some 300 projects go on there at any one time, and about 800 users per month use the center's Cray Research, Inc. machines, he said.

Corporate bucks

Corporations also are important sponsors of the center. Roskies said Aluminum Company of America, Westinghouse Electric Corp. and unnamed petroleum companies and Wall Street firms conduct research on the huge Cray computers.

Westinghouse used to have its own supercomputer center, fitted with a Cray X-MP machine. But the cost of the center got so high that the company scrapped it in 1994 and began using the Cray C-90 at the Pittsburgh Supercomputer Center, said Lynn Layman, a consulting analyst at Westinghouse.

The change in supercomputing strategy saved Westinghouse "considerable" sums, Layman said. The company uses the computer for structural analysis and computational fluid dynamics, he added.

Scalable Alpha machine

Roskies said he soon will take delivery of the first Cray T3E with 32 processors, scheduled to grow to 512. The nodes are Digital Equipment Corp. Alpha processors, each rated at 600 million floating-point operations per second.

William Wulf, a computer science professor at the University of Virginia and a member of the task force that recommended the program changes, said the new program will put more emphasis on having a spectrum of computers, from midpower to the very "biggest and meanest." He said more priority will be put on "training and handholding."

"I really think it's a stronger program," Wulf said. "But it's obviously upsetting to the current centers."

'Mini-library' aimed at Magstar

Besides hoping to be first on the block with a virtual-volume feature for mainframes, Memorex Telex also is targeting IBM's Magstar tape drive in the midrange market.

Memorex Telex last month quietly started shipping a drive that is accompanied by a 60-cartridge "mini-library" autoloader for backing up AS/400, Unix, Windows NT and LAN data. The 5450ML is a shot across the bow of the SCSI-based version of Magstar, which began shipping last fall.

The 5450ML was made for Memorex Telex by Overland Data, Inc. in San Diego. It costs $31,500 and has a 144G-byte capacity using standard 3490E cartridges. IBM's Magstar costs about $50,000, can store 300G bytes and is supposed to be able to transfer data up to three times faster than a 3490E.

But Magstar uses new high-capacity cartridges that aren't compatible with 3480/3490 technology. The IBM drive also is still fairly hard to come by due to supply constraints, said Robert Gray, an analyst at International Data Corp. in Framingham, Mass.

But Gray said the 5450ML also faces strong competition from tape subsystems based on Quantum Electronics Corp.'s DLT tape drives. DLT technology is relatively slow, but it supports up to 20G bytes of uncompressed data per cartridge, compared with 800M bytes on the 3490E.

Eric Eldridge, product manager for client/server storage at Memorex Telex, said an upgrade due late this year should quadruple the amount of data that can be stored on each cartridge in a 5450ML. — *Craig Stedman*

[redacted]

Tatung Science & Technology, Inc. has unveiled SuperCompstation 20 HS151 and SuperCompstation HS152-MP, two Unix workstation models compatible with Sun Microsystems, Inc. SPARCstation 20 models.

According to the Milpitas, Calif., company, the workstations are based on Ross Technologies, Inc.'s HyperSPARC RISC processors that run at 150 MHz and are 30% faster than Sun's SPARCstation 20s.

Standard configurations for both models include a 20-in. color monitor, two Mbus slots, four 32/64-bit Sbus slots, 32M bytes of RAM, a 1.05G-byte hard drive and internal 16-bit audio capabilities. The HS151 uses a single 150-MHz processor. The HS152-MP model includes two 150-MHz processors.

Pricing for SuperCompstation 20 HS151 starts at $15,615. Pricing for the HS152-MP model starts at $21,015.

▶ *Tatung Science & Technology*
(408) 383-0988

QMS, Inc. has introduced IHS UDK2PCL, a printer protocol converter.

According to the Mobile, Ala., company, IHS UDK2PCL is a mainframe print conversion product that lets users take advantage of network printing and document handling capabilities without losing the printing functionality of applications residing on mainframe systems.

The printer protocol converter clears a migration path for Xerox Corp.'s 2700, 3700, 4235, 4045 and 4213 systems to QMS Crown laser print systems.

The print systems translate and print Xerox User Defined Key (UDK) and Xerox Escape Sequence without rewriting the host application.

Pricing for IHS UDK2PCL printer protocol starts at $4,200.

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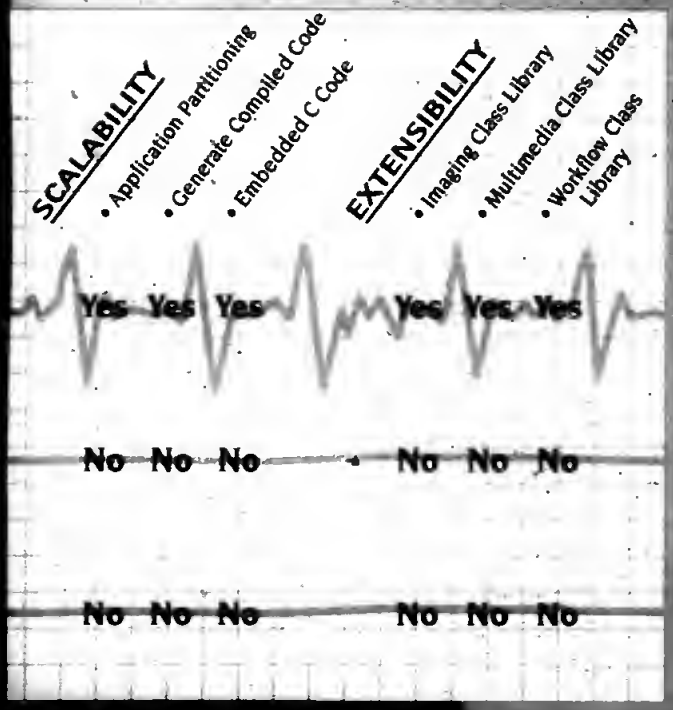

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Digital tries new bait to lure vendors

OpenVMS-to-NT program may increase catch

By Michael Goldberg

Digital Equipment Corp. may be off to a healthy start in offering tools to integrate Windows NT applications with OpenVMS servers, but industry observers say the company needs to keep plugging away at attracting more software vendors.

With the launch last month of the OpenVMS-to-Windows NT affinity program, Digital set out to pave a path toward client/server systems for its most faithful users.

The vendor already has signed several software companies (see chart). They include database makers Oracle Corp. and Software AG of North America, Inc., and application development tool makers Cognos Corp. and Information Builders, Inc.

Application development

The program is good news for Digital's installed base because it expands their working environment to include another operating system and more tools. The first wave of the affinity program includes products, both available and promised, from 20 vendors.

The products will be geared toward users who integrate Windows NT applications with their OpenVMS systems and will include database management systems and client/server application development tools. Software AG, for example, is offering database systems for OpenVMS that range in price from $900 to $121,000, depending on the number of end users.

So far, Digital "got the tools vendors who are strongly supporting OpenVMS" to take part in the program, said Dan Kusnetzky, an analyst at International Data Corp. in Framingham, Mass.

Future looks bright

Jean Quesnel, a senior systems analyst at Nutat Technologies, Inc., an Ottawa-based consulting firm, said he likes the flexibility and sense of a solid future that he gets from Digital's OpenVMS/Windows NT strategy. "Without it, there would be a lot of question marks about [VMS]," Quesnel said.

Robert Steven van Keuren, a senior program analyst at Action Instruments, Inc. in San Diego, said Digital's ability to attract software partners for its Windows NT program could help his long-time VMS shop stick with Digital. Action Instruments makes industrial I/O devices and is looking for a new enterprisewide system.

Action Instruments is a prime example of the type of VMS customer that Digital can use to attract application software vendors such as Cognos. Ottawa-based Cognos sells Axiant, an application development tool for OpenVMS and several Unix platforms.

Digital NT

The following software developers will help Digital users integrate their OpenVMS systems with application servers running Windows NT

Database	Oracle Rdb, Oracle7*, Software AG
Client/server application development tools and middleware	Cognos, Information Builders, Forte Software, Progress Software, Process Software, Raxco
Applications	Ross Systems, SAS Institute

*Not yet available

Exchange draws groups, but for E-mail system

By Tim Ouellette

You may be able to teach an old dog new tricks, but people won't necessarily pay to see them.

This seems to be the case with Microsoft Corp.'s Exchange Server software. Although the vendor is beefing up some groupware functions that were removed in past beta versions, many customers are more interested in the software's traditional messaging features.

In fact, observers said these electronic-mail strengths are what will help Exchange ward off competitors such as Notes and the World Wide Web [CW, Jan. 8].

"You won't buy Exchange for internal discussions alone; you buy it for E-mail," said David Marshak, an analyst at Patricia Seybold Group in Boston.

"Exchange is the next logical step in improving everything over Microsoft Mail," said Garth Keesler, a staff consultant at Intergraph Corp. in Huntsville, Ala.

Exchange provides a client/server messaging infrastructure with additional groupware features. Microsoft's current LAN-based messaging software, Microsoft Mail, is based on the more common file-sharing architecture, which has its limits when faced with a large number of users in widespread locations.

Bigger and stronger

The beta version of Exchange, which Keesler helped install at U.S. sites for 3,500 of Intergraph's 4,500 Microsoft Mail users, beefs up security, systems administration and the user interface, he said.

"We are hoping Exchange is a more robust E-mail system," with better administration features and scalability but without the administration problems of Mail, said Karen Alonardo, network operations manager at Electronic Arts in San Mateo, Calif., a Microsoft Mail 3.2 user.

Alonardo said she manually synchronizes the mail directories herself because Mail doesn't do it reliably on its own.

Exchange should remedy such failings, said Michael Sullivan-Trainor, an analyst at International Data Corp. in Framingham, Mass., because it will now support the management features of Windows NT and integrate with Microsoft's BackOffice suite of server applications.

Redmond, Wash.-based Microsoft also added local replication to Exchange in December. This lets users replicate data from a public folder to a laptop, for example. Previous beta copies supported only server-to-server data replication. Local replication is important to mobile or remote users, who can access updates to databases and work on them off-line without being connected to the Exchange Server.

Greg Lobdell, Exchange product manager at Microsoft, said the company hit the ship date for the final beta in December. As a result, Exchange should hit the streets this quarter — about two years late.

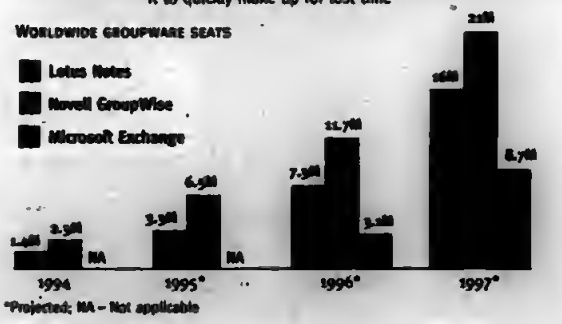
But at least migration from Microsoft Mail to Exchange shouldn't take years.

"It looks like Microsoft has a smooth upgrade while keeping Microsoft Mail up and running," said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston. This is because Mail clients can still work with the Exchange server, while giving shops the option of using the Exchange clients that ship free in Windows 95, a big plus for Exchange sales.

"I am hoping that it is going to be pretty transparent to the user community," Alonardo said. "If I went with something like Notes, it would be a complete transition for users here."

Big changes for Exchange

When Microsoft Exchange Server hits the streets, analysts expect it to quickly make up for lost time



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Maintenance software gets hot new image

Client/server computing, GUIs help make over market

By Julia King

Glitzy, red-hot, cutting-edge. Rarely have these words been used in the same sentence with maintenance management software.

And that is for good reason. Up until a few years ago, systems for planning and tracking the care of engines, turbines and other costly equipment were mostly homegrown, mainframe-based and highly inaccessible klunkers.

"We used our [mainframe-based] legacy system mostly as an electronic file cabinet to hold work orders," said Gary Carr, an engineer and project manager at Unocal Corp.'s San Francisco refinery.

Other maintenance-related tasks — such as scheduling repairs to the refinery's 2,000 pumps, compressors and motors and 38,000 various instruments — all were performed manually.

But all of that is changing.

Thanks to client/server computing and graphical user interfaces, maintenance software suddenly is hot and getting hotter. With these new technologies, accessibility and usability are improving — so much so that by 2000, the maintenance software market should top $1 billion, according to International Data Corp. in Framingham, Mass.

Driving this growth are twin downsizing and just-in-time production strategies, which place tremendous logistics and cost-cutting burdens on maintenance personnel.

Part of the equation

Another key factor is industrial companies' shift from so-called "run and repair" maintenance to predictive maintenance, which is less disruptive and estimated to be five times less expensive.

> **"Traditionally, in large companies, maintenance has been thought of as a necessary evil done by grease monkeys and wrench-bangers. But maintenance is really a science if you do it correctly."**
>
> **— Gary Carr, advising engineer and project manager, Unocal**

Consider the case at the Metropolitan Atlanta Regional Transit Authority (MARTA), which has embarked on a $6.7 million maintenance re-engineering project. A largely paper-based system will be replaced with Atlanta-based TSW International, Inc.'s client/server maintenance planning and control (MPAC) software.

The software lets managers in multiple locations plan, schedule and track the labor and parts needed to maintain the transit company's 700 buses, 200 railcars and hundreds of other facilities scattered over a 54-mile area.

"Before, we had little islands or pockets of PC systems for tracking work order information, but we tracked labor on a time card, and we tracked materials through a mainframe-based system that most people didn't have access to," recalled James A. Young, chief administrator for rail services.

Easy access

Now, virtually anyone involved in transit operations and maintenance can access data on equipment failures, work orders and images of parts diagrams and electrical systems from PCs distributed throughout executive offices and on the shop floor.

About 60 maintenance personnel in the field use battery-powered handheld computers and mobile software from Future Horizons, Inc. in Atlanta to access equipment history, parts inventory information and work orders stored in MPAC's database.

More accurate and timely information has enabled MARTA to better plan maintenance. Its backlog for heavy repairs such as engine rebuilds has shrunk from three weeks to four days, Young said.

The Metropolitan Atlanta Transit Authority *is replacing a largely paper-based system with client/server maintenance and planning and control software*

Reduced costs

Unocal is implementing Maximo maintenance management software from PSDI, Inc. in Cambridge, Mass. Accessibility to more accurate information will cut $4 million a year from the refinery's $40 million annual maintenance budget, Carr said.

And thanks to an interface between the Maximo software and Unocal's Oracle Corp. client/server financial applications, all maintenance-related labor and material costs are automatically passed along to the main accounting system.

"But cost savings is only one aspect," Carr said. "By looking at frequency of [equipment] failures, you can also look at your preventive maintenance program, start predicting when something will break down and focus your resources on these high-impact areas."

Users discover little-known benefits of sorting software

By Dan Richman

Users with data-intensive loads can get improved decision-support performance if they use a utility they might not even realize exists.

Sorting software puts data into a user-selected order, making the data quicker to access.

"We save 80% in time by using an external sort package instead of the sorting routines in the operating system," said Van Grotenhuis, a manager at Andersen Consulting in Minneapolis.

Grotenhuis uses SyncSort from SyncSort, Inc. in Woodland Hills, N.J., to administer a 100G-byte database of 100 hospitals' patient care data to analyze how different doctors treat similar conditions. Files are sorted six times before they are processed further. This "reveals the most essential information in the records," he said.

Performance boost

Several other users reported performance increases of between 50% and 80% when using sorting packages. These figures are compared with the sorting applications that come native with an operating system or relational database management system.

When raw data is entered into files or an RDBMS, it usually is stored in the same order it was entered. To be meaningful, it must be rearranged. For example, merchandise orders to an 800-number probably come in randomly from all 50 states and are stored that way. To analyze sales trends, the seller would want to rearrange the ordered items by state, ZIP code or SKU number.

Sort utilities allow that. They are optimized to import the data, rearrange it and output it in a new order.

When data is stored in flat files, or outside of a commercial RDBMS, some kind of external sorting utility is essential.

The utility could be a third-party vendor's or the sorting utility that is built in to every implementation of the Unix operating system as well as many other operating systems.

When data is contained within an RDBMS, sites can simply use the system's built-in sort utility. But vendors of sorting utilities say their products outperform the sorting that is built in to RDBMSs and operating systems.

One such user is Gary Beynon, a programmer at Firm Solutions, Inc. in Walnut Creek, Calif., a service provider to health care companies.

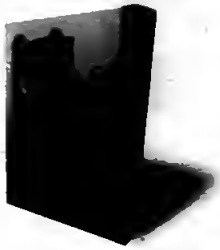
"When we eased off mainframes and developed our Unix database to administer workers' [compensation] claims, we wanted something to help with the transition that was also more capable than the sorting in our [operating system]," Beynon said. "It had to be record-oriented and capable of indexing binary data, unlike the one in Digital Unix."

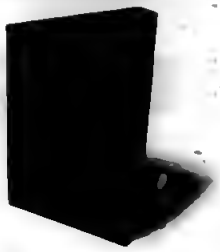
Beynon's company chose Cosort from Innovative Routines International, Inc. in Melbourne, Fla.

Just your sort

Leading vendors of sorting software

Innovative Routines International, Melbourne, Fla.	Cosort	DOS, Unix, Amdahl and Fujitsu	$1,000 to $15,000, depending on platform
Opt-Tech Data Processing, Zephyr Cove, Nev.	Opt-Tech Sort	DOS, Windows, Windows NT, OS/2, SCO Unix, Xenix, C source code	$149 (DOS and Windows); $249 (OS/2, Windows NT and Unix); $499 (C source code)
SyncSort, Woodland Hills, N.J.	SyncSort	AIX, HP-UX, Solaris SPARC, Pyramid	$1,000 to $12,000, depending on platform





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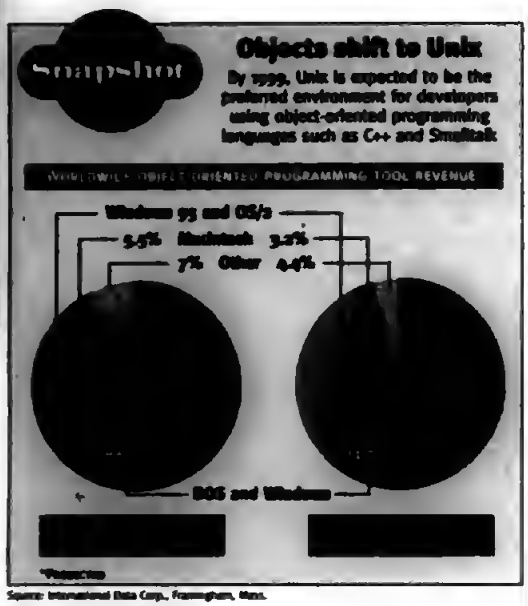

Source: International Data Corp., Framingham, Mass.

Kaleida sticks to ScriptX and ships new release

By Lisa Picarille

Just days before being absorbed by Apple Computer, Inc., Kaleida Labs, Inc. last week shipped an updated version of its ScriptX object-oriented multimedia programming language.

By adding support for TCP/IP to the release, Kaleida is positioning ScriptX as an alternative to Sun Microsystems, Inc.'s popular Java Internet-based scripting language. However, it is unclear how Apple plans to position the product when it assumes development responsibility. Cupertino, Calif.-based Apple already has come out as a staunch Java supporter.

Programming language

ScriptX had been marketed as a way for users to create multimedia titles that would be distributed via CD-ROM. But the popularity of the Internet as a multimedia distribution channel prompted Kaleida to rethink that strategy, according to Mike Braun, president and CEO of the Mountain View, Calif., company.

The update still lacks Internet security features, but it goes beyond Java to store "platform-independent persistent objects," Kaleida officials said. Users, while on the Internet, can create and store ScriptX objects or applets in real time. Later, users can retrieve those objects from a World Wide Web site and drop them into any running application. This saves the time it takes to recreate objects for multiple applications.

"The new version of ScriptX makes it easier to send multimedia applets, and it's easier to use than Java," said Neil McManus, executive editor of "Digital Media," a newsletter in San Francisco. On the other hand, he said, Java's feature set is "more extensive" than that in ScriptX.

Version 1.5 of ScriptX now runs native on Apple's Power Macintosh and offers enhanced printing, more extensive Musical Instrument Digital Interface support, image compression and improved development tools.

Braun said it was important to get the product out the door before Kaleida closed. IBM and Apple announced in November that they would close Kaleida, which will become part of Apple later this month.

"We were just several weeks from completing the product when IBM and Apple announced that we would be shut down and absorbed into Apple's organization," Braun said. "Despite the obvious disruptions and transition, we wanted to ship the product and show that we are committed to our customers."

IBM rings in new year with SOMobjects for MVS

By Frank Hayes

Just about the time New Year's party-goers were tuning up for "Auld Lang Syne," IBM finally delivered the long-awaited mainframe version of its object-oriented middleware.

IBM on Dec. 29 began limited shipments of SOMobjects for MVS Version 1.1, which will let application modules on MVS mainframes communicate with software components on IBM Unix servers and Windows or on OS/2-based PCs.

Like other object middleware, System Object Model (SOM) lets developers write application modules that communicate through the middleware. That makes client/server development much easier because the middleware handles all communications details among modules on mainframes, servers and PCs.

"If the organization is committed to use objects, SOM is the logical approach for an IBM shop like us," said C. F. Wong, an object specialist at the Bank of Montreal Computing Center in Toronto. The bank hasn't yet tried distributed SOM but is interested in the software, he said.

It isn't just "true-Blue" devotion that encouraged mainframe developers to wait for the IBM version. Other vendors, including Digital Equipment Corp. in Maynard, Mass., and Sapiens USA, Inc. in Cary, N.C., already have object technology products for developers on MVS mainframes. But using those tools requires substantial development work to link existing applications to the object middleware.

And new mainframe-based development work, even using objects, won't pop any corks at most information systems shops. "We have other compelling problems on the mainframe side than trying to retrofit legacy systems with objects," said a systems manager at a technology services group in Minneapolis.

IBM spent much of last year linking the SOM infrastructure to key MVS subsystems such as CICS, DB2 and IMS. This will allow client/server applications that run on smaller systems to access mainframe data through the SOM middleware — and to get benefits from SOM without rewriting legacy systems.

SOMething for everyone

SOM, which started out as the object architecture for OS/2, is now IBM's middleware for linking all its platforms. Developers can write application modules as if they all were going to be on a single system — as long as they communicate only through SOM. Modules can then be deployed on different platforms, and the SOM middleware will keep track of what platform each application module is on and handle communications between modules. The middleware makes client/server applications easier to develop and maintain because SOM provides a single virtual system. The developer doesn't have to worry about communications issues.

Cobol compiler ships

For developers who are willing to rewrite code, IBM in November began to ship its first Cobol compiler that supports SOM. A Smalltalk compiler, now in beta testing, should arrive sometime in the second half of the year, according to Jerrie Stewart, mainframe application development software manager at IBM.

But simply connecting SOM to MVS doesn't make it a cure-all. Some large organizations face a more recent legacy problem: They have invested heavily in the Open Software Foundation's Distributed Computing Environment (DCE) for client/server networking.

"Our big interest is in DCE, which IBM is also working on," said the director of architecture at a major manufacturer. "If SOM can be well-integrated with DCE, then we will keep looking at it."

Mercury Interactive Corp. has announced that XRunner, its automated tool for testing graphical user interface client applications, will integrate with Hewlett-Packard Co.'s SoftBench 5.0 development environment.

According to the Sunnyvale, Calif., company, this integration will let users access XRunner directly from SoftBench. Users can launch XRunner and run tests on an application by choosing from menus within the SoftBench tool set. Users also can send messages from within XRunner tests. The messages let developers synchronize test execution and other SoftBench tools.

XRunner runs on HP 9000 Series 700/800 workstations. Pricing starts at $10,000.

▶ *Mercury Interactive (408) 523-9900*

StratoWare Corp. has introduced MemCheck 3.5 for Windows.

According to the Ann Arbor, Mich., company, MemCheck 3.5 for Windows is an automatic runtime bug detection tool for C/C++ programmers who develop Windows applications. It lets developers detect memory leaks, the misuse and leakage of objects, Windows resources and other errors that can hurt the reliability of Windows applications. It integrates with existing C or C++ code and works at runtime to identify errors by exact source file and line number in the source code.

Pricing starts at $179.

▶ *StratoWare (313) 996-2944*

ACI U.S., Inc. has introduced 4th Dimension Software Development Kit (4D SDK), a development package for building, compiling and distributing ACI U.S.'s 4th Dimension applications.

According to the Cupertino, Calif., company, 4D SDK includes 4th Dimension, a cross-platform, relational database with programming language; 4D Compiler Pro, a machine code compiler that generates code for Windows and Macintosh; and 4D Insider, a code browser and cross-reference tool that provides a structural dictionary of 4th Dimension databases. It also comes with 4D Engine, a component for building, compiling and distributing 4D databases.

Pricing for 4D SDK starts at $2,995.

▶ *ACI U.S. (408) 252-4444*

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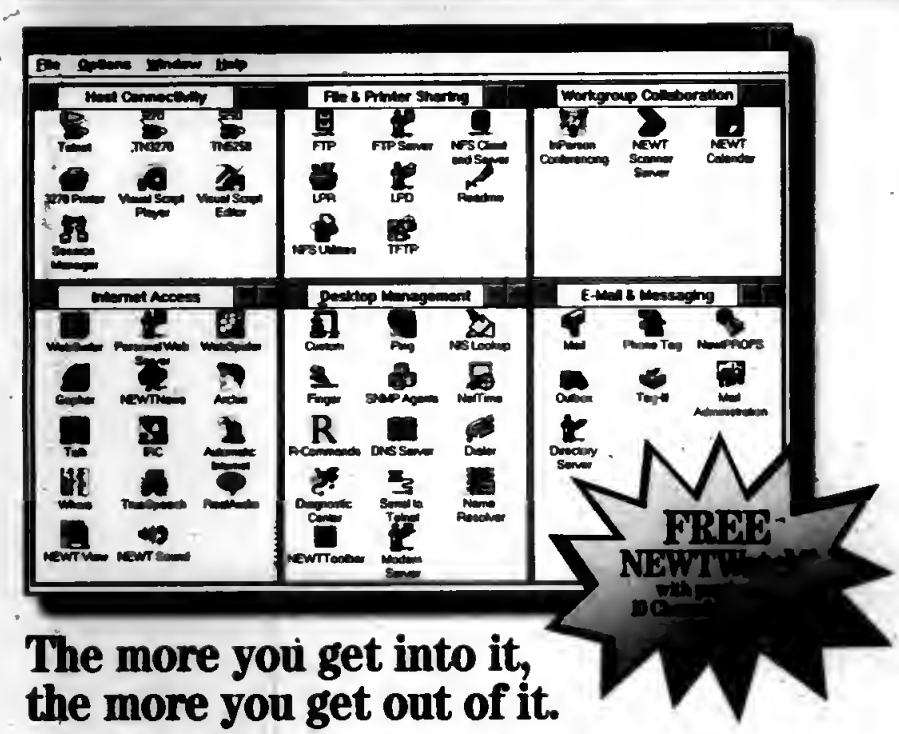

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WIRELESS WINS MARKET SHARE SLOWLY BUT SURELY, 60
NEW PRODUCTS, 65

The Enterprise Network

LANs • WANs • NETWORK MANAGEMENT

Net services go out to bid

By Neal Weinberg
NEWINGTON, CONN

United Technologies Corp.'s recent transition from private lines to public frame-relay service went so smoothly that the Fortune 50 company now wants to outsource its entire 158-country network.

Traver Kennedy, an analyst at Aberdeen Group, Inc. in Boston, said United Technologies is at the forefront of a significant trend. Large companies, which had traditionally built and maintained their own private networks, now are looking to the long-distance carriers to handle their wide-area network needs.

To save money and improve network efficiency, United Technologies decided last year to switch from leased lines to frame relay for sending SNA traffic to 450 domestic sites, said network services manager James Garlans.

Frame relay

Outsourcing gains

The transition went so smoothly that monthly staff meetings to discuss network problems, a holdover from the private line days, were disbanded for lack of agenda items.

Under the prior system, every change meant United Technologies staffers had to re-engineer the entire network. With AT&T Corp. providing frame-relay service, if Garlans needs to add bandwidth at a particular site, he just picks up the phone and orders it.

Garlans' bosses at United Technologies were anticipating a 12-month transition period, but the entire network was cut over in a mere 90 days. Teams consisting of United Technologies staffers, an AT&T worker and a technician from Motorola, Inc., which supplied the frame-relay access devices, got so fast they could install the service in less than 30 minutes per site.

Once Garlans became convinced that he could buy networking as a service, he realized, "I'm not wed to a particular service; I can get anybody." That led to the decision to "bid the whole thing out."

United Technologies is seeking a single provider to satisfy its voice, data and videoconferencing needs worldwide. It expects to award the contract early this year.

Garlans said it is always a difficult decision to outsource a function that has traditionally been performed in-house. Outsourcing requires a major cultural change, and staff reductions are typical. Furthermore, it isn't yet clear that the carriers can deliver on United Technologies' specifications.

But Garlans said he believes the carriers can do it, although they will have to forge alliances to provide the global reach that United Technologies requires.

According to Kennedy, the needs of multinational corporations have grown in scope and complexity in recent years. Companies now need transparent LAN-to-WAN configurations, and they need to transport voice, data and video in one seamless network.

Garlans said he believes it is time to challenge the carriers to follow through on their marketing hype. "Let's see if we're beyond the glossy-brochure syndrome," he said.

Applications get smart with management skills

By Patrick Dryden

Help is on the way for users who seek tighter management links to their client/server applications.

Client/server applications are challenging to manage. So vendors and standards groups are taking the concepts and architectures used to manage networks and systems and applying them to applications. The goal is to create a set of defined objects that lets an application handle queries and status input from other applications and monitoring tools.

Market update

These efforts are needed by companies such as Temple Inland Forest Products Corp., which went to a client/server architecture as part of a mill modernization effort. The mill produces 2,000 tons of paper products a day, and it couldn't depend on external operators and monitoring tools to manage its networked applications.

The applications needed more management intelligence. To get it, Temple Inland developers had to write

Applications, page 65

LANtastic fosters PC internetworking

By Laura DiDio

Artisoft, Inc. recently released 32-bit Windows 95 client software for its LANtastic peer-to-peer network operating system.

LANtastic for Windows 95 lets Windows users exchange files, print services, electronic mail and CD-ROMs with DOS, OS/2 and Windows 3.11 users on LANtastic networks. Early beta users, such as Victor Brandao, said they liked LANtastic's ability to integrate various types of PCs on the same network.

"I don't know of anything else that will let you internetwork a DOS machine with Windows 95. The LANtastic for Windows 95 software is very straightforward to use and configure," said Brandao, a computer consultant at Integrated Business Solutions, Inc. in Coral Gables, Fla. "And best of all, it's unobtrusive to end users; anyone in the workgroup can access all the services of Windows 95."

Melvin Kenoly, president of X-Ware Engineering Corp., was similarly

LANtastic, page 65

LANtastic for Windows 95 features and availability

Lets administrators view and add groups and users from central management monitor

A custom control panel lets users customize tabs and buttons

Pricing starts at $349 for the starter kit

Frame relay tops with users

Carriers see little demand for FUNI

By Neal Weinberg

A FUNI thing happened on the way to the forum ... the ATM Forum, that is.

The market dubbed frame relay the low-speed data transport of choice, bypassing the frame-based user-to-network interface (FUNI) initiative, whose specifications are still being ironed out by the Asynchronous Transfer Mode (ATM) standards body.

FUNI transmits frames, like frame relay, but uses ATM-compliant signaling. That means it can support ATM network management and quality of service, which frame relay can't do.

None of the long-distance carriers offer FUNI, and none are racing to get there first. AT&T Corp., for example, says it hasn't closed the door on FUNI but won't offer it until there is market demand.

The carriers are, however, offering a FUNI alternative, service interworking, which lets users connect frame relay at remote sites to an ATM backbone.

AT&T and Sprint Corp. offer this now, and MCI Communications Corp. is expected to join them early this year.

Ron Jeffries, an analyst at Jeffries Research in Santa Maria, Calif., said the carriers are staking their bets on frame relay, which has been "a huge success." In fact, Jeffries said demand for frame relay as a less expensive alternative to leased lines is so strong that the carriers "almost can't install the equipment fast enough."

Slow route

FUNI transmits variable-length frames at the relatively low speeds of 56K bit/sec. to 1.5M bit/sec.

When it comes to adding an ATM backbone to an existing frame-relay network to handle high-bandwidth needs, service interworking "can solve just about the same set of problems" as FUNI, Jeffries said.

And while frame relay is a relatively mature and stable technology, FUNI and ATM are still works in progress, said David Goodtree, an analyst at Forrester Research, Inc. in Cambridge, Mass.

There is hope yet

Goodtree said FUNI may yet find a niche among users without frame relay who know they are going to an all-ATM network and need an interim data solution. But users with frame-relay networks who need to upgrade some sites to ATM should look to service interworking as a way to protect their frame-relay investment, he said.

Goodtree said frame relay will continue to dominate the market for several years. He predicts ATM won't begin to take off until 1998, and even then, ATM won't replace frame relay — the two will co-exist.

Despite its slow start, "FUNI is still a good idea," said Tom Nolle, an analyst at CIMI Corp. in Voorhees, N.J. He said FUNI is important because it provides a true ATM interface.

But Rosemary Cochran, an analyst at Vertical Systems Group in Dedham, Mass., said there is "not a lot of impetus" for FUNI — and with good reason.

From the user perspective, there are other ways to make a frame-relay-to-ATM connection, primarily through service interworking.

Jeffries added that from the carrier point of view, there is no reason to offer FUNI. "Until users demand it, why complicate your life?" he said.

Briefs

Pac Bell offers recovery services

Pacific Bell in San Francisco has teamed up with Network Recovery Services, Inc. in San Ramon, Calif., to offer automated backup and business recovery services to network users. Users linked to the service will be able to click on icons of damaged or missing files from their workstations to automatically replace the files.

From the Amazon to the Internet

Advanced Computer Communications, Inc. in Santa Barbara, Calif., has announced the Amazon Point of Presence. The package includes the company's Amazon Integrated Services Digital Network (ISDN) router with an Ethernet interface and an ISDN Primary Rate interface, all for $7,995.

Wireless wins market share slowly but surely

Report predicts widescale acceptance of voice and data networks by year 2000

By Mindy Blodgett

Whither wireless? According to a recently released report, it depends.

The report, from The Yankee Group in Boston, says wireless networks have a ways to go before they can claim ubiquity and widespread use.

But by the end of this decade, wireless communications, particularly the cellular and personal communications services (PCS) voice and data networks, will be well on the way to widescale market acceptance, the report predicts.

According to the report, paging and cellular voice are expected to get 25% of the mass market by the year 2000.

"Cellular and paging are on the cusp of mass market acceptance," said Mark Lowenstein, director of wireless/mobile communications at The Yankee Group. "It's a question of when, rather than how, to acquire paging customers. But portable computing and mobile data via wireless will be a little later in following."

Driving the cellular/PCS market will be lower airtime prices and greater competition.

Millions and millions

A recent Yankee Group report predicts the following: By 1997, cellular/PCS will have 39 million subscribers; paging, 34 million; enhanced specialized mobile radio (ESMR), 3 million; mobile data, 5.9 million; and portable computers, 20 million. By 2000, the report predicts that cellular/PCS will have 62 million subscribers; paging, 55 million; ESMR, 6 million; mobile data, 9.9 million; and portable computers, 38 million.

Numbers game

In fact, The Yankee Group predicts that by the end of the decade, there will be 62 million cellular/PCS subscribers and 55 million paging subscribers. Between 2001 and 2005, the analysts predict that cellular/PCS will achieve enough growth that wireless voice communications will be a viable alternative to traditional telephony services.

The report contends that there is considerable pent-up demand for wireless services. Of 871 noncellular users, 24% say they wished they had wireless of any form. Of that group, 16% said they are considering a wireless purchase, such as cellular or two-way messaging via PCS.

The main obstacle to mass-market acceptance of portable computing as a platform for wireless communications is cost, applications and availability, Lowenstein said. These factors are less inhibiting to corporate users.

Users want "shrink-wrapped" solutions, and buying a portable computer and then searching out a wireless modem and a wireless network are complicated, difficult propositions, Lowenstein said.

"The emergence of [value-added resellers] in this area, which we are seeing more and more of, will help this market," Lowenstein said.

Where is wireless now?

Wireless technology has strengths and weaknesses in these areas:

	Cellular/ Personal Communications Services	Paging	Portable Computing/ Mobile Data
Ease of use	Very intuitive	Easy form factor; two-way paging will eliminate steps	Has come a long way since acoustic couplers—but still scary
Reliability	Improving	Very high	High because of RAM/ARDIS data services
Availability	More than 90% of the U.S. has access	Very high	Improving
Business/ Personal use	A mix for most users	Purchase decision is business-driven but is used for personal reasons, too	Almost 100% for business
Usage cost	High	Very low	High
Available applications	Broad	Will broaden	Still being defined

Source: The Yankee Group, Boston

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pentium

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THE NETWORK IS THE COMPUTER

Applications

CONTINUED FROM PAGE 59

Unix-based scripts to monitor vital applications and report to systems management tools.

Developers lacked the necessary tools, from the traditional mainframe world to fully control applications, said Milford Ratcliff, director of information services at Temple Inland in Diboll, Texas.

While the scripts they wrote helped, "we're looking for a better, more integrated management solution," Ratcliff said. "We want the earliest notification we can get to any problem with a server or application, so we don't lose any information."

Ratcliff said he hopes Unify Corp.'s AppMan, a set of tools and software agents for the Vision client/server development environment, will help Temple Inland developers more quickly identify and respond to equipment problems in key applications.

Temple Inland isn't alone in wanting to see client/server applications primed for easy management.

"The trend toward enabling direct application management is crucial," said John Rymer, a senior analyst at Giga Information Group in Norwell, Mass. "Applications are the business focus; ultimately, the goal of all network and systems management efforts is to figure out application performance," he said.

Administrators complain about the complexity, time and expense required to figure out the behavior of applications in client/server environments, Rymer said.

Another vendor trying to ease its pains is Tivoli Systems, Inc. in Austin, Texas. Tivoli has created a specification that lets developers define events and indicators in their code and pass them directly to the Tivoli management console, Rymer said. He added that the first implementation for monitoring SAP AG's R/3 applications will be released soon.

On the case

Meanwhile, standards groups are trying to tackle this problem.

The Desktop Management Task Force last month enhanced its specification for application management. Version 2.0 of the Software Management Information Format file adds dynamic capabilities, including deinstallation, beyond the initial static reporting of version number or audit date.

The Internet Engineering Task Force has a complementary effort under way. The Application Management Information Base file will provide a standard way to manage any application remotely with tools using the Simple Network Management Protocol.

Management from the inside out

Network and systems management tools help track factors that affect performance of client/server applications. Application management tools help developers build management awareness in to the actual application. These tools answer different questions:

NETWORK MANAGEMENT TOOLS let administrators monitor components (lines, hubs and routers)

- Can data get between clients and servers?
- What users or services are using the network?
- How busy is the network?

SYSTEMS MANAGEMENT TOOLS let administrators monitor nodes, server resources and availability for applications

- Which nodes have problems?
- How is the server using memory, disk space or processing power?
- How is an application using those resources?

APPLICATION MANAGEMENT TOOLS enable software to monitor itself and report on its operation

- Are users responded to as expected?
- Does this server or network failure affect my operation?
- Are resources running out or losing touch with vital nodes?
- Are vital nodes accessible?

LANtastic

CONTINUED FROM PAGE 59

pleased with LANtastic for Windows 95's ability to interconnect multiple PC environments via the common LANtastic server. "This type of functionality is a must for us," Kenoly said.

LANtastic for Windows 95 also incorporates centralized network management capabilities. Among them is a template facility that lets network administrators create profiles of user attributes just once. The template is automatically applied and updated as new users are added to the network.

Artisoft also has added four new levels of access for network administrators.

"Securing network data is increasingly important these days, and I'm very pleased with the security and flexibility of LANtastic for Windows 95," said Rev. James Termyna at Saints Cyril and Methodius Church in Boonton, N.J.

LANtastic for Windows 95 is available in several configurations. A single-user version costs $119; a five-user pack costs $499; a 10-pack costs $899; and a 25-user version lists for $1,799. Upgrades cost $79 for a single user and $299 for five users.

Users also can purchase a two-user starter kit for $349 that includes software, two network interface cards and cabling.

[redacted]

Connectware, Inc. has unveiled Cruiser 1.1, communications groupware.

According to the Richardson, Texas, firm, Cruiser 1.1 combines several communications functions, including LAN- and modem-based electronic mail (including Internet mail), group scheduling, telephone dialing, faxing and voice data switching.

Cruiser 1.1 was designed to track a workgroup's schedules, coordinate phone conferences and meetings and generate to-do lists and calendars for all team members.

It also can import names and addresses from contact programs and can be used as a stand-alone mail system or as part of a corporate Messaging Application Programming Interface (MAPI) mail network.

In a MAPI mail environment, Cruiser can serve as a mail gateway that lets off-site users access mail services.

Pricing for Cruiser 1.1 starts at $149.

▶ *Connectware*
(214) 997-4111

Amber Wave Systems, Inc. has announced that AmberSwitch, an Ethernet switch, now includes SoftSwitch Application-Specific Integrated Circuit, a custom-programmable switch engine.

According to the Acton, Mass., company, AmberSwitch is a plug-and-play, full-featured LAN switch that now gives users new features and standards through software downloads.

AmberSwitch was designed for workgroups, LAN traffic support and client/server and multimedia applications.

Pricing for a complete eight-port AmberSwitch starts at $1,995.

▶ *Amber Wave Systems*
(508) 266-2900

SCM Microsystems, Inc. has introduced SwapCrypt, a PCMCIA encryption card.

According to the Los Gatos, Calif., company, SwapCrypt secures data by encrypting an original file to a temporary file, permanently wiping out the original file and renaming the temporary file with the name of the deleted file. It then overwrites the original data file three times.

To ensure maximum security, SwapCrypt protects data by using five-character passwords for each different data file of directory encrypted. It also incorporates data compression for maximum storage and transfer efficiency.

SwapCrypt includes a Type I PCMCIA encryption card and a floppy disk for initialization of the encryption key and backup. It requires an Intel Corp. I486-based PC, 4M bytes of RAM, a PC card slot and Windows 3.1.

It costs $99.

▶ *SCM Microsystems*
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The Internet

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Smoother surfing promised

New software products cache Web pages on user's hard disk

By Mitch Wagner

Experienced Internet users know that "surfing" is one of the great untruths of the world — right up there with "The check is in the mail."

Surfing implies grace and speed, but searching the World Wide Web, especially on a dial-up connection, involves neither of those things. You click on a link, wait a minute or two for the text and graphics to be downloaded, look it over, click on another link, wait a couple of minutes more for the new page, look it over, and repeat. Experienced 'net users know to keep a newspaper handy for all the downtime spent downloading.

But now, two companies — Specter Communications in Belmont, Mass., and the ForeFront Group, Inc. in Houston — have developed competing products designed to make the waiting time less onerous. The products cache Web pages on a user's local hard disk.

How the caching software works

1. Users preset URLs for the software to read and designate how many pages adjacent to those URLs to retrieve
2. The software automatically connects to the Internet and stores the designated pages on local hard disks
3. The software adjusts links to keep the relationships between pages intact
4. Users view the pages off-line, at their leisure

Organized display

Instead of click-wait-and-read, click-wait-and-read, the user selects all the Web pages he wants to view. The software, which works with any standard Web browser, takes several minutes to gather up all the Web pages, then presents them to the user, who can read them as fast as a hard disk can display them.

Caching software is invaluable to anyone who looks at large numbers of Web sites, one user said.

"Anybody that does Web design ... is going to want this tool," said Mark Johnson, a creative director at JMedia in San Jose, Calif., a multimedia development company. JMedia uses ForeFront's WebWhacker. "When we're studying a site, we set it up to download overnight, and we find the information waiting for us locally in the morning," Johnson said. The tool lets JMedia keep up with what is being done on the Web.

Specter's WebWatch Version 2.0 offers greater functionality but is available only on Windows 95. ForeFront's WebWhacker is available on Macintosh, Windows 3.1 and, later this month, Windows 95.

Timed caching

Both programs offer similar functionality in downloading Web pages and storing them locally — WebWhacker refers to this as "whacking the Web." WebWatch offers a couple of extensions. Using WebWatch, the user can also preprogram set times for the software to go out and cache documents off the Web.

Meanwhile, corporate users and others who publish information on the Web can write special agent software that will customize WebWatch to retrieve changes to their Web site. The publishers can distribute the agent software to their users. For example, *The San Francisco Examiner* plans to distribute a WebWatch agent to allow users to pick up a Web edition of the newspaper each day, said Specter director Kirk Scott.

WebWatch costs $45 per copy. WebWhacker is priced at $49.95.

Breaking news

Specter Communications is working with *The San Francisco Examiner* to make a daily electronic edition available on the Web that can be read off-line.

http:

Outsourcing

A whopping 93% of you will outsource at least one business or technology function by 1999, up from 85% today. Or so say 303 business managers quizzed by Arthur Andersen last month.

For a little looking before leaping, try some of these Web sites.

- Outsourcing Institute hosts http://www.outsourcing.com. The site is split into sections on buying outsourcing services, getting started, a reference library and a discussion group.
- Service providers big and small have opened on-line outposts. SunGard Computer Services, for example, runs http://www.sca.sungard.com, while Outsource Agents in Grand Rapids, Mich., can be found at http://www.outsourceagt.com.
- An article by software guru Capers Jones that enumerates some of the pros and cons of outsourcing can be found at http://www.spc.com/knowbase/kb94sep/outsourc.htm.
- The University of Texas recently launched a Web-based discussion group dedicated to the topic at http://cbm.bus.utexas.edu/issues/issue31/index.html. Here, you can talk about technology and career issues related to outsourcing.
- The law firm Fenwick & West has posted a lengthy paper on some of the stickier issues in outsourcing deals. The site, at http://www.counsel.com/locator/fenwick/pub/avvua.html, includes guidelines for negotiating price reductions, minimum performance standards and damage awards for a vendor's failure to perform, as well as other topics.

– *Kim S. Nash*

Users seek benchmarks to test Web server performance

By Kim S. Nash

How the heck do you check the speed of cyberspace?

Information systems managers building World Wide Web applications have started to demand a speedometer with which to measure the performance of Web server software from Process Software Corp., Netscape Communications Corp., Microsoft Corp. and others.

"Right now, a lot of users are buying on instinct or what they've heard about a particular product," said Joel Snyder, a senior partner at Opus One, Inc., a Tucson, Ariz.-based network consulting company.

Web metrics

Users "don't have much hard evidence to use to evaluate which product might be best for their situation," he said.

Although there isn't yet a single, widely accepted tool for rating Web servers, a couple of benchmark methods have begun to emerge. One of the more popular stress tests is Webstone, which was created last year by engineers at Silicon Graph-

Benchmarks, page 68

Numbers game

Webstone, at least for now, is the only metric for judging Web server performance that is somewhat widely accepted. The following is a Webstone status report:

Company	Webstone benchmark
American Internet, *Bedford, Mass.*	Yes, to be announced this month
Microsoft, *Redmond, Wash.*	No
Netscape, *Mountain View, Calif.*	Yes, see http://www.netscape.com
O'Reilly & Associates, *Sebastopol, Calif.*	No
Open Market, *Cambridge, Mass.*	Yes, see http://www.openmarket.com
Spyglass, *Naperville, Ill.*	Yes, to be announced this week
Wollongong Group, *Palo Alto, Calif.*	No

FTP Software buys groupware provider

By Kim S. Nash and Suruchi Mohan

Three months after Netscape Communications Corp. bought groupware maker Collabra Software, Inc., another Internet software company has done a similar group(ware) hug.

FTP Software, Inc. in North Andover, Mass., late last month put up $10 million to buy tiny HyperDesk Corp. in Westboro, Mass.

Ready for the 'net

The merged company in the next several months plans to build Internet capabilities, such as support for threaded discussion groups and the World Wide Web, into HyperDesk's PC-based GroupWorks, said Bob Strong, vice president of research and development at HyperDesk.

The move comes none too soon for fledgling HyperDesk; its 24 employees started shipping GroupWorks last May. The current version lacks Internet support, which is key to attracting new customers, said Jim Garden, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

Groupware products overall are undergoing a 'net transformation. Netscape early this year is expected to merge its Web browser with Collabra's Share package. IBM this month plans to ship Notes 4.0, a new version of the groupware granddaddy, which has been enhanced by several Internet features.

The FTP/HyperDesk deal is expected to be final next month, Strong said, pending approval by HyperDesk's majority owner, Ascii Corp. in Japan.

Worldwide groupware

The following groupware products are for linking to the Web

Vendor	Product	Availability
FTP	HyperDesk GroupWorks	*
IBM	Lotus Notes 4.0	Now
Netscape	Unnamed combination of Netscape Navigator and Collabra Share	Mid-1996

*Pending FTP's April acquisition of HyperDesk, which is expected to be approved in the first quarter.

Benchmarks

CONTINUED FROM PAGE 67

ics, Inc. (SGI).

Spyglass, Inc. plans to release a new, faster version of its Web server this week along with a slate of Webstone results. Open Market, Inc. and Sequent Computer Systems, Inc. claimed "record-setting" Webstone performance last month.

Where to find it

An outline of Webstone basics resides at the Web site http://www.sgi.com/products/webforce/webstone/paper.html. In broad strokes, Webstone metrics come in five flavors:

- Connect time for a client to get to a server.
- Data throughput rate of information moving between client and server.
- Average number of pages retrieved by client.
- Average number of files retrieved.
- Response time of client requests of the server.

To make sense of Webstones, users must consider what kind of work they want to measure. Product features are often more important than high grades for speed, according to Graham Silver, a senior consultant at Bell Sygma, Inc., a telecommunications provider in Toronto with 50 to 60 intranet servers.

"If you're not running an airline reservation system, super-high performance might be down there on your list of factors," he said.

Not there yet

Webstones were written for Unix systems but have been applied to Windows NT-based servers. No formal benchmark exists for Web servers that run on Novell, Inc.'s NetWare or Apple Computer, Inc.'s Macintosh or Power Macintosh systems.

And Webstones aren't a perfect indicator of server performance in some situations. An intranet program, in which a company might use the Internet internally for human resources or inventory applications, usually requires that the Web server interact with corporate databases. Webstones, however, don't measure the performance impact of that type of setup.

In fact, what Webstones don't measure is critical for some applications. Webstones don't take into account the effects of scripts, or miniature programs, that are written to connect Web servers to, say, relational databases or other storehouses of information. Nor do Webstones consider the performance effects of security programs that users may build atop a given server.

These and other provisions will be added to upcoming versions of the Webstone specification "in the near future," said Gene Trent, a software engineer at SGI and principal author of the Webstone benchmark. But Trent could give no specific time frame.

Meanwhile, a handful of software and hardware makers that belong to the nonpartisan Standards Performance Evaluation Committee (SPEC) is writing a new specification called SPECWeb. It is due out this spring.

Unlike the Webstone specification, SPECWeb will include allowances for scripts and other features to make SPECWeb better reflect how Web servers are used in corporate settings, said Dan Johnson, a product manager at Spyglass, which is helping to write SPECWeb.

MEDICAL ALERT...

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NetCarta Corp. has announced WebMapper, a navigation and management tool for World Wide Web sites.

According to the Scotts Valley, Calif., company, WebMapper lets Web site managers create an overall picture and analyze the sites they construct. It also allows users to create data file displays of various objects on a Web site, including text, graphics, audio and video.

WebMapper identifies defective links, links to nonexistent files and files on the same site with no links to them. It was designed to give users direct access to all pages of a Web site at once by showing descriptions of all of them.

WebMapper is available for Windows NT and Windows 95. It costs $499.

▶ *NetCarta*
(408) 461-8920

Incontext Corp. has introduced Spider 1.1, publishing software that lets users create World Wide Web pages with point-and-click commands.

According to the Toronto company, Spider 1.1 lets users take advantage of Hypertext Markup Language (HTML) extensions in both the Microsoft Corp. Internet Explorer and Netscape Communications Corp. Navigator browsers. It also converts any Windows word-processing document into HTML and includes 28 home-page templates with more than 200 clip-art images.

Spider 1.1 costs $79.

▶ *Incontext*
(416) 922-0087

Telegrafix Communications, Inc. has introduced RIPaint-2, universal on-line multimedia publishing software.

According to the Huntington Beach, Calif., company, RIPaint-2 lets users create multimedia electronic newspapers and information services.

Users can also create television-style production effects integrating photographic images, graphics, text and digital sound into a single screen.

RIPaint-2 speeds up transmission and display of on-line multimedia by encoding graphics as compressed ASCII text files. It was designed to operate with any on-line system. It is comparable with the Internet and any wired or wireless communications networks that use 7-bit or 8-bit ASCII text.

RIPaint-2 costs $100.

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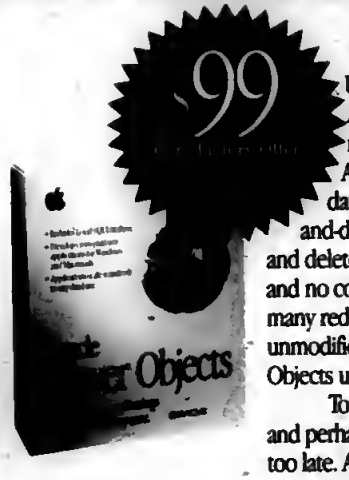

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YEAR 2000 CONTROVERSY WOULD MAKE A GOOD MOVIE, 72

Corporate Strategies

CASE STUDIES • TRENDS • OUTSOURCING

Net attacks up, defense down

By Gary H. Anthes

Attacks against networked computers are on the rise. But users' ability to defend against them suffered a setback recently when the premier computer incident response team said it is getting out of the incident response business.

Almost simultaneously, the group — the Computer Emergency Response Team (CERT) at Carnegie Mellon University in Pittsburgh — issued a notice that it had responded to a rash of network assaults in the past several weeks.

In those few weeks, "hundreds of sites have been attacked, and many of the attacks have been successful," the CERT said in a warning sent over the Internet. "We continue to receive reports, and we believe that more attacks are going undetected."

Change in strategy

Unfortunately, the CERT will no longer attempt to address every attack report. Previously, it had responded to every request for help.

Instead, the CERT will shift its resources from incident response to research, said Richard Pethia, manager of the Trustworthy Systems Program, which administers the CERT. That is the wish of its sponsor and chief funding source, the Pentagon's Advanced Research Projects Agency, he said.

However, for the foreseeable future, the CERT will continue to broadcast alerts over the Internet and respond to "widespread threats on the 'net," Pethia said. But it won't guarantee a response to attacks that appear to be limited to a small number of users, he said.

One new research area for the Trustworthy Systems Program will be the design of security tools that are much more comprehensive than those available today, Pethia said. A longer-term project will investigate ways to build systems that are fundamentally less vulnerable.

Some companies have already taken internal measures to decrease their dependency on CERT. Rockwell International Corp. in Seal Beach, Calif., is among a growing number of corporations that are setting up their own computer incident response teams. Rockwell has a central team at corporate headquarters and satellite teams at each of its 30 major business units.

Al Brusewitz, director of information security at Rockwell, said he forwards CERT alerts to Rockwell business units worldwide. He also relies on his staff and two other key groups: the Department of Energy's Computer Incident Advisory Capability (CIAC) and the International Information Integrity Institute at SRI International in Menlo Park, Calif.

Filling the gap

Some companies with incident response groups have joined the Forum of Incident Response and Security Teams (FIRST), a network of 45 teams from vendors, users organizations, academia, federal agencies and other countries.

FIRST has set up an electronic-mail distribution list by which it exchanges information about security threats and defenses among its members, said Mark Graff, chairman of FIRST and a security manager at Sun Microsystems, Inc. in Mountain View, Calif.

Graff said FIRST will "take up some of the slack" left by the CERT's changing role. For example, it will offer some centralized services, such as the compilation of Internet break-in statistics, and

'net attacks, page 72

Making Notes more than E-mail

By Suruchi Mohan

Once a company has made the expensive decision to install Notes, it must next decide how to effectively unleash the power of this multifaceted groupware product.

That isn't always easy. Many large corporations buy numerous Notes licenses from Lotus Development Corp. in Cambridge, Mass., only to find employees use Notes just for electronic mail.

One way to encourage exploration and use of the various Notes features is to write applications that tap into those broader capabilities.

US West Technologies' John Schulz created Issues Infonet, a bulletin board for company news, on Notes. It can be routed to the company's 14 E-mail systems.

For the masses

US West Technologies, Inc. in Denver is one company tapping Notes' expansive capabilities. By writing some simple applications, John Schulz, a senior project manager for groupware, has transformed Notes from groupware for the privileged few to a company communications medium for the masses. Interestingly, only 5,000 of the company's 34,000 E-mail users have Notes.

Notes is a way to integrate many different kinds of documents, said Chris

Notes, page 72

Spin-off picks outsourcing

By Mitch Wagner

Ralston Purina Co. decided two years ago that selling food to people was a very different business from its mainstay animal-food line.

For one thing, humans don't eat from bowls on the floor — well, that is, unless they are in college fraternities.

After cataloging the other, more subtle differences, the pet food giant decided the only thing to do was to spin off its people-food business into a separate corporation. And so it did.

Managing IS

The result was a $1 billion entity — Ralcorp Holdings, Inc., the people-food line. The St. Louis company makes cereals, including the Chex line, and Beech-Nut baby foods. Ralcorp also runs several ski resorts.

Information systems staff members weren't incorporated into the spin-off. That left the new company with an extensive array of computers and software but no one to manage them.

That might sound like a curse. But it actually proved a blessing, said Hank Krey, vice president and chief information officer of Ralcorp. It allowed Ralcorp to look around and select the best IS option for its business needs without worrying about convincing IS staff of the benefits.

After pondering the alternatives, Ralcorp decided outsourcing was the answer. In August, the company hired Cap Gemini America, Inc. in New York as the main contractor in a $100 million, five-year outsourcing deal. Genix Group in Dearborn, Mich., was brought on board to manage data center services, and I-Net, Inc. in Bethesda, Md., will

Outsourcing, page 72

Craig Stedman

It's just a movie

So what will you be doing four New Year's Eves from now? Joining The Artist Formerly Known as Prince and partying like it's 1999?

Or working feverishly in the data center bunker to expand the date fields in your mainframe applications so they don't go kablooey when the clock strikes midnight and 2000 arrives?

Most people who tend to mainframes can't say for sure, and therein lies the peril of the whole year 2000 conversion process. But that peril is a big fat vein of gold begging to be mined — and not just by consultants and software vendors.

To Hollywood, I say: The year 2000 issue has great movie written all over it.

Taking *Apollo 13* as our guide, we could call it *Data Center 2000*. I see drama. I see pathos. I see Tom Hanks in a doomed data center, calling his CEO on the phone and saying, "Mr. Lardbottom . . . we have a problem."

There are plenty of story lines just begging to be plumbed:

Tick, tick, tick . . . Some deadlines can be fudged, but not this one. It's year 2000 or bust for mainframe shops, which have to modify applications with two-digit dating so the software won't interpret "00" as 1900. No feeble excuses allowed.

With four years minus two weeks to go, it may seem like there's still plenty of time. But year 2000 aficionados insist that you're already behind if your conversion program isn't under way.

Finding and changing all the date fields hidden in the unmapped back alleys of your 25-year-old financial system is tough enough. Testing the application to make sure it still works will be the real backbreaker.

So let's bring back the *Speed* team of Keanu Reeves and Sandra Bullock to race against disaster one more time. Forget the bus, though. This time it will be their applications that are at risk of exploding.

Controversy. Some users view this as a bona fide crisis; many others are relatively blase about the dangers. John Phelps, a Gartner Group analyst who is sounding the year 2000 alarm, acknowledges being on the receiving end of "Chicken Little" labels. "But people just don't understand how ugly the solution to this problem is," Phelps says.

This is where our movie becomes a Kevin Costner vehicle. He can reprise the *JFK* role that had him laboring mightily to convince the doubters in power he was on to something more than just a fit of hysteria. If he danced with wolves, he should be able to program with Cobol.

Fallen geniuses. My mainframe-phobic colleagues express equal parts amazement and bemusement at the fact that the programming brains behind mainframe applications didn't account for the end of the 1900s. There was method to the madness: Mainframe storage was excruciatingly expensive 30 years ago, and limiting all those date fields to two bytes saved tons of space.

Yet the fact remains that some exceedingly smart people set their companies up for a big fall. Maybe we could get Robert DeNiro and Al Pacino to play retired programmers racked with guilt and angst. Or would grumpy old guys Jack Lemmon and Walter Matthau — laughing all the way to the bank to cash their pension checks — be more appropriate?

Of course, we have to decide what kind of a movie to make — black comedy or tragedy? Well, let's sleep on that a while. We've got time, right?

Stedman is *Computerworld*'s senior editor of IBM large systems and software.

Net attacks

CONTINUED FROM PAGE 71

serve as a "rumor control" center.

Other groups are stepping into the breach left by CERT's withdrawal.

Earlier this year, IBM and Science Applications International Corp. launched commercial incident response services. IBM's Internet Emergency Response Service helps subscribers respond to attacks, periodically tests subscribers' Internet connections and issues security alerts tailored to each subscriber's environment.

The CIAC at Lawrence Livermore National Laboratory also is gearing up to meet increased demand, according to CIAC manager Sandy Sparks. The CIAC serves the Energy Department and its major contractors and is seeking contracts with other federal agencies.

Five types of attack

The recent CERT advisory listed five common types of attack, each of which had been the subject of an earlier advisory.

"What the CERT is trying to say is, 'You dummies, pay attention. Why haven't you taken advantage of the things we told you before?' " said Michael Roberts, networking vice president at Washington-based Educom, an association of information systems specialists at colleges and universities.

Where to go for information

Organizations offering free notices about computer security threats include the following:

- Computer Emergency Response Team, Carnegie Mellon University. To subscribe to alerts, send E-mail to cert@cert.org, and put in the message text, "I want to be on your mailing list."
- Computer Incident Advisory Capability, U.S. Department of Energy. To subscribe, send E-mail to ciac-listproc@tis.gov, and put in the message text, "subscribe ciac-bulletin Lastname, Firstname phonenumber."
- Hewlett-Packard Co. To subscribe, send E-mail to support@support.mayfield.hp.com, and put in the message text, "subscribe security_info."
- Sun Microsystems, Inc. To subscribe, send E-mail to security-alert@sun.com, and put in the message subject line, "SUBSCRIBE CWS your-e-mail-address."
- Internet Security Systems, Inc. To subscribe, send E-mail to request-alert@iss.net, and put in the message text, "subscribe alert."
- Forum of Incident Response and Security Teams (FIRST). For information about FIRST, visit http://www.first.org/first.

Source: Internet Security Systems, Inc., Norcross, Ga.

Outsourcing

CONTINUED FROM PAGE 71

manage desktop, network and help desk services. Ralcorp turned over the keys to the systems in August.

Cap Gemini assembled a 160-person staff to serve as Ralcorp's IS department. Besides functioning as prime contractor, Cap Gemini also handles client/server services, procurement and developing new systems.

Krey, meanwhile, oversees an internal Ralcorp IS staff of a half-dozen people who were brought on board after the decision to outsource was already made.

"Usually when you bring in outsourcing, you spend all your time trying to make your staff get their minds right," Krey said. "But my management staff came in expecting it."

But hiring a new management staff could create problems, said Tim Bourgeois, an analyst at International Data Corp. in Framingham, Mass. "They're going to have zero familiarity with the infrastructure and the business function," he said. "On the other hand, [information technology] isn't a strategic component to making food."

Ralcorp awarded the contract to the Cap Gemini team after reviewing similarly priced bids from outsourcing giants such as Electronic Data Systems Corp., IBM's Integrated Systems Solutions Corp. subsidiary and Ernst & Young.

The decision was based on Ralcorp officials' belief that the company would have more clout with Cap Gemini. Ralcorp is the first big U.S. outsourcing contract for the European outsourcer. "We had the decision whether we wanted to be a big fish in a small sea or a small fish in a big sea," Krey said.

Cap Gemini also let Krey interview and select the core team of managers it would use to run the IS operation. The others allowed him to meet only a single account manager.

Feeding the machine

A grocery list for IS at food giant Ralcorp Holdings

Hardware

- 1 IBM 3090 mainframe
- 9 IBM AS/400s
- 6 Hewlett-Packard HP 9000s
- 15 OS/2 clients and servers
- 1,200 Windows-based PCs

Networking

- EDI running on a TCP/IP network

Applications

- Oracle Financials
- General ledger
- Factory floor systems

IS staff

- 160 outsourcing consultants working with a half-dozen Ralcorp staff

Notes

CONTINUED FROM PAGE 71

McGuire, manager of data center support services in Denver. For example, Issues Infonet, a homegrown application that serves as a bulletin board for all internal company news, can be created in and/or exported to Notes, then routed to the rest of the company's 14 E-mail systems.

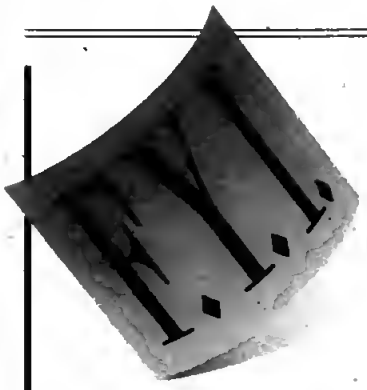
"We had access to the Issues Infonet in the [IBM] Profs environment, but the information there didn't get posted in as timely a manner," said David Bradford, manager of labor relations in Denver. "In Notes, more documents are available for a longer time."

The application is deceptively simple. A user creates a company announcement in Notes or a word processor and then exports it to Notes. At the same time, the sender can click on a button to send the form to a central hub, which then routes the memo to the bulletin board of each of US West's E-mail systems.

Meanwhile, the Issues Infonet database replicates the document in a database designed for the World Wide Web. The document is then published on the Web. Schulz said he has customized the design of the Notes database so the same data — on a different form — looks great on the Web.

"It is much easier to work in Notes than in HTML," Schulz said, referring to the Hypertext Markup Language used on the Web. "When Notes documents get replicated to Web databases, they are converted to HTML, so the user doesn't [have to] do anything."

Fannie Mae does its training (where else?) in-house. *Page 77.*



The information industry and its leaders, future

Here's a chance to see the future through some of the industry's best eyes. Cyber Business 2000, a collection of 13 videotapes, was recorded at the 1995 Forrester Technology Management Forum. The speakers, who discuss the information industry's future, include Microsoft Corp.'s Bill Gates, MCI Communications Corp.'s Vinton Cerf, Netscape Communications Corp.'s Marc Andreessen and several Forrester Research, Inc. analysts.

Each tape includes a speech, an onstage interview and audience questions for one of the pooh-bahs. The Gates presentation focuses on the Internet, with specific questions on how mass-market software will be sold and delivered in the near future. Despite his presentation of a cheesy Microsoft-produced video-within-the-video, Gates' speech succeeds.

The series' production quality is top-shelf, and sharp audience questions prevent the sessions from becoming one big love-in. Upper-level information systems managers may pick up some worthwhile takes on what lies ahead. Price is $24.95 per tape or $195 for the series.

For more information, contact Worldwide Target-Demographic Television, Deerfield Beach, Fla. (305) 427-9655.

FYI, *page 75*

Know-How, Inc.

Once a conference curiosity, knowledge management is catching on.

By Joseph Maglitta

Clip and save this article. If "knowledge management" keeps gaining popularity, you'll need the advice given below sooner rather than later. Building systems to manage organizational know-how — until recently just another nice idea — has become real work for real information systems people at Monsanto Co., Bechtel, Inc., Cigna Corp. and dozens of others.

"If you can bring shared company experience and knowledge to solve a customer problem, why reinvent the wheel?" asks Victor Baillargeon, vice president of knowledge transfer at Buckman Laboratories International, Inc. The Memphis-based maker of specialty chemicals credits much of a 250% growth in sales in the past decade to its brainpower-sharing via on-line forums.

Although approaches vary, knowledge management in general tries to organize and make available important know-how, wherever and whenever it's needed. This includes processes, procedures, patents, reference works, formulas, "best practices," forecasts and fixes. Technologically, intranets, groupware, data warehouses, networks, bulletin boards and videoconferencing are key tools for storing and distributing this intelligence.

Knowledge management, *page 74*

Knowledge Management for Dummies

Want an easy way to understand knowledge management? Think about your own work.

Say Notes and Netscape keep crashing each other. You call the helpdesk down the hall to fix things. Well, imagine these tricks are codified on Notes or some other knowledge base — as they are at many help desks. Now anyone on the network can benefit from these smarts.

Multiply that tens of thousands of times to include all the other nuggets of "knowledge" that exist in your firm. Select the most important, codify them and help people find them. That's knowledge management.

CONTINUED FROM PAGE 73

Interest has risen since last summer [CW, June 15]. Recent conferences by Ernst & Young and Arthur Andersen & Co. with the American Productivity and Quality Center were jammed with IS and business leaders from the U.S., Korea, Canada, Italy, the U.K. and Switzerland.

A small but growing number of IS groups have begun creating "knowledge bases" (databases that contain knowledge), lists of experts, information maps, corporate yellow pages, custom desktop applications and other systems to help knowledge workers be more effective.

Payoffs are still inconclusive, and companies just now are beginning to understand how best to harness know-how. But behind the talk of "corporate memory," "intellectual capital" and "learning organizations" may lie a new way of looking at what you do and how you do it.

If knowledge management is your next big assignment, here are some tips from the pioneers on getting it done:

- **Don't confuse it with decision support.** "There, you put information in a black box, and the answer comes out," says Paul Ayoub, a vice president of IS at Cigna in Philadelphia. "In knowledge management, you're not making the decision for the person but guiding them to make a better decision."
- **Do it your way.** "There are no cookie-cutter solutions," says Arian Ward, leader of learning and change for Hughes Space & Communications Co.

The El Segundo, Calif., aerospace giant decided the best approach was to create "The Hughes Knowledge Highway." Described by Ward, a former IS consultant, as "a human network that uses technology," the highway employs videoconferencing, Notes, employee home pages and other technologies. Among other things, the highway is used to spread new management practices, track patents and licenses and gather competitive intelligence.

In contrast, Bechtel decided the best foundation for its infant knowledge management effort was an enterprise document management system from Documentum, Inc. in Pleasanton, Calif. "Authoring, managing and controlling requisitions, reports and [purchase orders] drive our whole business," explains Frank Matthewson, engineering manager at the San Francisco-based engineering firm.

The company, aided by EDS Strategic Desktop Services, has installed Digital Equipment Corp. VAXstation and Alpha servers in five U.S. offices. A planned rollout this year will bring the system to 4,000 to 5,000 users worldwide, Matthewson says.

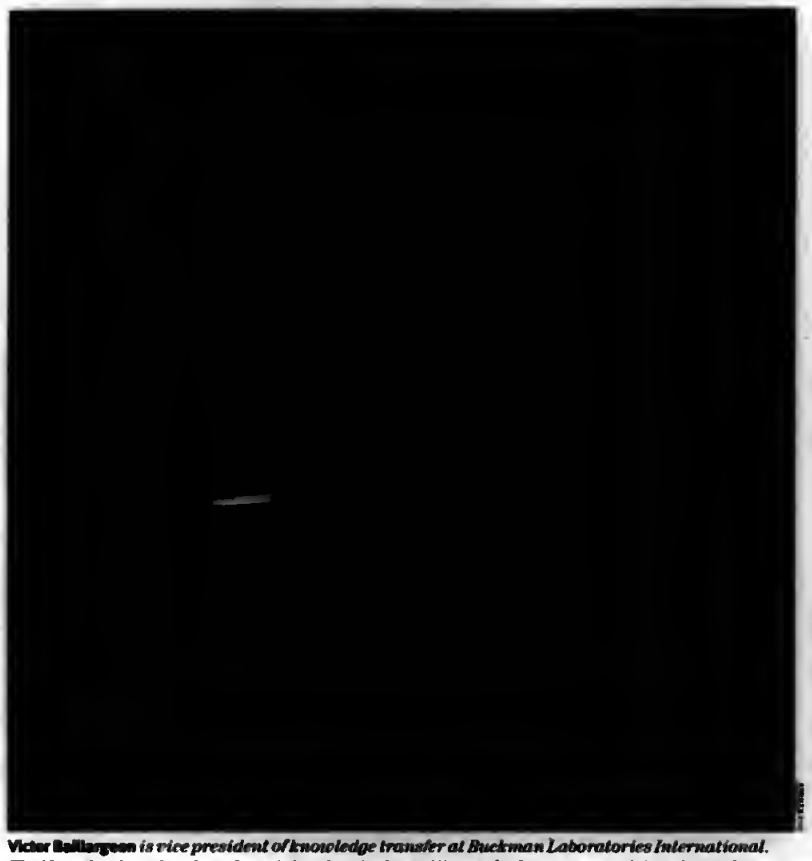
A civil engineer using the system will be able to access vast troves of information on past projects, including plant designs and equipment specifications, says Richard Armstrong, director of organizational learning. Internet links will let users download earthquake and weather data directly from the World Wide Web, he adds.

- **Learn how people work.** Every job, from janitor to CEO, has a certain rhythm and things you must know. Learn what they are, advises Larry Prusak, an Ernst & Young principal in Boston. He suggests you imitate the Chemical Banking Corp. IS analyst who moved his desk out to the loan originator's area for several weeks. The result: a usable knowledge system.
- **Sharpen your joint application development and rapid application development skills.** Experienced developers say it's crucial to start with work processes, not technology, and deliver fast — like Cigna's Property and Casualty division.

Last year, the $4 billion specialty insurer set out to create a new desktop knowledge system for underwriters. Renaissance Solutions, Inc., a Lincoln, Mass., consulting firm, suggested a two-day "innovation workshop" to encourage creative suggestions from users. Half-day feedback sessions at dozens of field offices also were held.

Initial rollout began in February 1995 and ended in July. So far, some 300 customized IBM PS/2 Model 70 client/server systems have been installed in 30 branch offices. With a few mouse clicks, underwriters can invoke dozens of worksheets, forms, motor vehicle and financial reports and lists of company experts.

Thomas Valerio, Cigna's trans-



Victor Baillargeon *is vice president of knowledge transfer at Buckman Laboratories International. The Memphis-based maker of specialty chemicals credits much of a 250% growth in sales in the past decade to its brainpower-sharing via on-line forums.*

Knowledge discovery and data mining site
A list of information on conferences, resources and journals
http://info.gte.com/kdd.other-servers.html

Learning organization site
Gateways into understanding the ideas driving knowledge organizations
http://world.std.com/LO

'Know Ware'

New offerings to help companies better manage corporate knowledge are starting to appear. Here is a sampling:

- **KnowledgeShare.** A client/server-based system for developing and managing enterprisewide repository on intranets. Cambridge Technology Partners, Inc., Cambridge, Mass. (617) 374-9800.
- **Winelle 3.0.** A Windows-based knowledge management system that adds faster data retrieval, more flexible report distribution, better graphing and support of Oracle client/server architecture. Winelle Systems, Chicago, Ill. (312) 443-8958.
- **GrapeVine for Lotus Notes.** A groupware management system that helps companies classify and index corporate knowledge using charts and profiles. Highly scalable, follows earlier release of client/server version. GrapeVine Technologies, Inc., Troy, Mich. (810) 680-6685.
- **Decision Suite 3.0.** An integrated suite that lets enterprise users navigate, filter, visualize and share live analysis and information. Information Advantage, Edina, Minn. (612) 820-0702.

formation officer, agrees that heavy user input and speedy development using Microsoft Corp.'s Visual Basic was crucial.

• **Think interaction, not transaction.** Look beyond people-to-system connections, says Bipin Junnarkar, knowledge project director at Monsanto. "The primary focus is connecting people with people and encapsulating that knowledge so it can be shared."

• **Create a knowledge web.** Buckman Labs' 1,200 employees in 80 countries have round-the-clock access to K'Netix — a rich global web of electronic forums, bulletin boards, virtual conference rooms, on-line libraries, knowledge bases and electronic mail accessed via IBM PC Co.'s ThinkPad 755s.

As it celebrates its 50th anniversary, the company is adding Notes and Internet support. It has overhauled its worldwide network to TCP/IP and is pulling data from Oracle Corp. databases onto internal Web servers, says Baillargeon, a Ph.D. chemist who oversees IS, telecommunications and research and development. "We can save a lot of money doing off-line work," he explains.

• **Show frequent payoffs.** In three years, Junnarkar has gone from pioneering knowledge management in Monsanto's Ceregen unit to rolling out the chemical giant's first enterprisewide data warehouse.

Junnarkar credits wider acceptance to quickly delivering the initial system and add-on modules. "You need to demonstrate success every so often," he says. "You don't say, 'What do you need?' and three months later come back."

The client/server system uses MicroStrategy, Inc.'s DSS Agent front end and an Oracle back end on a Digital Alpha workstation. The company warehouse contains "a genetic map" that includes charters, organizations and geographies.

• **Be selective.** "Most companies think if they get enough information, they will find answers," says Brooke Aikers, vice president of information technology at The Futures Group, a Stamford, Conn.-based consultancy. The result: information overload and smothering maintenance.

Better to pick a key question, strategy or business goal. "If you want to do business in China, what knowledge do you need?" asks John Heibner, a partner at Arthur Andersen in Chicago. Stop when you get enough. ■

Maglitta is *Computerworld*'s senior editor, re-engineering/corporate strategies.

CONTINUED FROM PAGE 73

Executive Track

Andrew B. Kregar was recently named vice president of the **Equitable Life Assurance Society of the U.S.**, a subsidiary of The Equitable Cos. He is responsible for equipment planning and acquisition for the New York-based insurance and investment company's Technology Management and Administration Department.

Kregar has worked at Equitable since 1986. Before that, he was an assistant vice president in data processing at Irving Trust (now Bank of New York).

Joseph T. Ambrozy is the new president and CEO of **Objective Systems Integrators** (OSI) in Folsom, Calif.

Industry veteran Ambrozy was Bell Atlantic Network Services' vice president of information systems from 1988 to 1993.

OSI is a provider of object-oriented client/server products and services.

First American Health Concepts, Inc. has appointed **Craig L. Santilli** vice president of IS. Santilli joined the company in September and has worked in IS at Samaritan Health System, Hartford Insurance Group and Cigna Corp.

First American Health Concepts in Phoenix markets and administers third-party managed vision care plans under the trade name Eye Care Plan of America.

Robert Nitschke has joined **Midcom Communications, Inc.** as executive vice president and chief operating officer. Nitschke previously worked in IS management at several firms, including U.S. Intelco Networks. Most recently, he was vice president of U.S. Intelco Holdings and president of its subsidiary, USI-Gateway, Inc.

Based in Seattle, Midcom Communications provides telecommunications services to businesses.

BDM International, Inc. has named **Donald J. Hirsch** vice president of corporate information systems. He has worked at BDM for 12 years, most recently as program manager, and replaced the company's legacy financial systems.

Based in McLean, Va., BDM is a provider of information technology, systems and services.

IS Manager's Bookshelf

New books, videos and CD-ROMs

The Great Transition, James Martin's book on enterprise engineering, now is available in hardcover (Amacom, New York; 520 pages; $34.95).

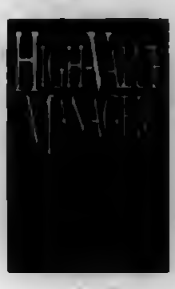
The book forms the basis for several articles that Martin, a lecturer and consultant, has published in *Computerworld* recently, including a Viewpoint column on Oct. 9.

Cost-Effective Strategies for Client/Server Systems
By Bernard H. Boar
(John Wiley & Sons, Inc., New York; 233 pages; $44.95, hardcover)

Writing for information systems managers trying to win corporate support for a move to client/server, AT&T Corp.'s Boar makes a powerful (sometimes vitriolic) advocate. He spends many pages taking on what he calls the Mainframe Preservation Society and makes economic and strategic cases for client/server. Good summaries and a strong index make the book easy to use. Don't skip the chapter on Sun Tzu's *The Art of War*.

The High-Value Manager: Developing the Core Competencies Your Organization Demands
By Florence M. Stone and Randi T. Sachs
(Amacom, New York; 224 pages; $24.95, hardcover)

While not IS-specific, this book will prove valuable to IS managers facing a leaner (meaner?) corporate future. It starts with a quiz that'll help you decide whether you should read on. If you do, you'll find chapters on all the usual suspects: empowerment, customer service, team facilitation and networking. But don't sigh "buzzwords" and move on; the advice here is always meaty and often hard-nosed. This is a good one.



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Gay Sleinger
Vice President
Giga Information Group

Discover what this phenomena means to business and the distributed enterprise.

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Enterprise Networking

Panel Moderator:
Tim Andrews
Vice President
CSC

Examine how the latest in converging communications technologies has been implemented to meet challenges faced by top corporations worldwide.

Hear candid discussion on building infrastructure, deploying high-speed communications, internetworking and implementing new broadband applications, which combine voice, data and images.

Enterprise Application Development

Panel Moderator:
Alan Alper
Editor
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Client/Server Journal

Explore the latest advances in application development, including the "killer-app of the '90s," data warehousing.

Listen to panelists reveal which new advances in application development work...and which don't.

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Murphy [illegible]
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70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers Computer Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

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19 Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21 Dir/Mgr MIS Services Information Center
22 Dir/Mgr Network Sys. Data/Tele Comm LAN Mgr /PC Mgr Tech Planning, Admin Svs
23 Dir/Mgr Sys Development Sys Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D Tech Mgr
60 Sys Integrators/VARs/Consulting Mgr

CORPORATE MANAGEMENT

11 President, Owner/Partner General Mgr
12 Vice President, Asst. VP
13. Treasurer Controller Financial Officer

DEPARTMENTAL MANAGEMENT

51 Sales & Mktg Management
70 Medical Legal Accounting Mgr

OTHER PROFESSIONAL MANAGEMENT

80 Information Centers/Libraries, Educators, Journalists, Students
90 Other Titled Personnel

3. Do you use, evaluate, specify, recommend, purchase (Circle all that apply)

Operating Systems

(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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65 Communications Systems/Public Utilities/ Transportation
70 Mining/Construction/Petroleum/Refining/Agric
80 Manufacturer of Computers, Computer-Related Systems or Peripherals
85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Dist./ Retailer
95 Other _____ (Please Specify)

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19. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
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Operating Systems

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(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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TRAINING YOU CAN BUILD ON

Bill Kelvie, *CIO at Fannie Mae*

Fannie Mae's in-house programs ease the move to client/server

By Steve Alexander

Until he joined Fannie Mae, systems developer David Dumbo (pronounced doom-bough) never thought he'd have a computer career.

"When I got out of college, this wasn't what I thought my job would be," says Dumbo, who had little hands-on information systems experience in college despite earning a master's degree in business administration and undergraduate degrees in computer science and economics.

What changed his mind was Business Systems Training (BST), an intensive entry-level programmer training class at the Federal National Mortgage Association, better known as Fannie Mae. The federally chartered private corporation provides mortgage funds for home buyers by investing in mortgages from institutions that originate them.

Homegrown experts

Because they address so many issues facing IS managers, Fannie Mae's training programs are worth a look. The corporation uses in-house expertise to meet its training needs. And this training makes it feasible to hire entry-level workers, thereby saving money. In addition, the program helps newcomers learn about the company's business and technology and allows Fannie Mae employees to change careers.

BST includes 16 weeks of full-time training in programming, data structures, logic, database concepts and case studies, with an emphasis on client/server and object-oriented programming. Trainees then move on to two years of on-the-job training.

BST is part of Fannie Mae's Systems Education and Learning Technologies (SELT) program, on which the firm spends close to $1 million a year. All the funding comes from the budget of the Office of Training and Development, not from that of the IS department.

"Management supports this," says Bill Kelvie, Fannie Mae's executive vice president and chief information officer. He adds that the support comes largely on faith, since Fannie Mae has no hard data to prove that the training programs work.

In addition to BST, the SELT program includes Client/Server Basic Training, Technology Management Seminars, Certification and Continuing Education, and Office Information Systems, a program aimed at educating end users in operating systems, spreadsheets, database management, word processing and presentation graphics.

Mark Helme, a training specialist at Fannie Mae's Office of Training and Development, says one of the popular office IS programs trains volunteer end users to help others in their departments with specific office applications, such as spreadsheets and word processing.

All told, the SELT programs train about 2,000 employees a year, many of them non-IS people who, nevertheless, are directly involved with IS through activities such as cross-functional teams. BST alone trains 20 to 60 people a year.

Born of necessity

The philosophy behind the SELT training programs was to help Fannie Mae deal with its wrenching conversion from mainframes to client/server systems in the early 1990s, when 3,000 employees received PCs within 18 months. BST, a mainframe-era training program, was adapted to client/server and combined with four new training programs to become SELT.

"When we began our client/server strategy in January 1991, we had three people who knew client/server out of 450 in IS," recalls Kelvie, whose staff has since grown to 800. "But we had very good mainframe programmers, so we went through a series of retraining, certification and continuing education programs. It worked very well, and they came out of this and could contribute right away."

While the training programs have been successful, Fannie Mae sometimes cuts corners that professional training firms wouldn't, according to Gustavo Crosetto, director of training and development at Fannie Mae. "We might develop and deliver a training program in a week even though it usually takes six months," he says. "We concentrate more on the end result, which is the performance of students, rather than on retention as measured by tests."

Crosetto's advice to other companies that might like to clone Fannie Mae's training programs is to not try to do it overnight. "It's taken us a good three to four years to reach the level we're at right now," he says.

Dumbo says that level is pretty high. After two years of on-the-job training, he's helping shift a mortgage tracking application from a Data General Corp. minicomputer to a client/server system. "I think I advanced faster than I would have otherwise," he says. "Without a doubt." ■

Alexander is a freelance writer in Minnesota.

Fannie Mae

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Buyer's Guide to Notebook PCs

They've come a long way

Sometime in the past year or two, you may have seen definitive signs of how pervasive notebook PCs have become.

First, airport security people stopped making you power them up. Then, your planemates stopped gawking and asking, "So, is that a real computer?"

Yes, they're real. For many users, notebooks that are paired with docking stations are their only computers.

In some circles, possession of a notebook is a status symbol, and the greatest status comes with the "premium" model.

Mike McGuire, an analyst at Dataquest, Inc., examines the "premium vs. value" concept (see story at right) and looks at the difference between "I like" and "I need."

The most powerful notebooks today pack almost as much punch as high-end desktop PCs. Power users may have 133-MHz Intel Corp. Pentium machines on their desks, while the fastest notebooks are only a step behind at 120 MHz.

The Tolly Group looks at five such notebook PCs — products in which multimedia capabilities prove just as important as CPU speed (see page 82).

A sixth machine, Compaq's LTE 5200, arrived too late for The Tolly Group tests, but I spent some fun, and not so fun, time playing with the notebook.

Beware if you are stepping up from a 486-class machine: These high-end boxes are heavier and hotter, and suck up improvements in battery design. Figure on a high-end notebook to weigh 6 pounds or more, with only a few hours of battery life.

Expect some lesser design flaws, and be ready for delays on orders because of backlogs (see chart, page 80). But the processing speed and multimedia capabilities can be awesome.

Notebooks rival desktop machines in more time technology. *Computerworld*'s Buyer's Satisfaction Scorecard (see page 84) shows that managers are basing their notebook purchasing decisions, whether for premium or value machines, on the same criteria they use to buy desktop PCs. Those factors include reliability and usability.

— *James M. Connolly*

Now appearing...

The omnipresent, opulent notebooks

By Mike McGuire

From the time I was 10 years old until I was 16, I wanted a Porsche 911. I mean, I really, really wanted one. Reality struck on my 16th birthday, when I was given the family's aging Volvo sedan instead. It ran, the lights and heater worked, and it was cheaper than a Porsche (and from my dad's perspective, cost much less to support). At that time in my life, that feature set didn't interfere with my ability to get to school and work. Right then and there, I learned the difference between the words "like" and "need."

What does this have to do with notebook PCs?

In many ways, IS managers who are responsible for purchasing and supporting notebooks for mobile workers must strike a balance between price/performance and user needs, similar to the balance my family struck when I started to drive.

Intelligent planning of a teenager's car use is a breeze compared with an IS manager's increasingly difficult task of weighing user requirements against notebook prices, feature sets and vendor support.

Five years ago, managing mobile computing for a company was simple because few, if any, people could justify spending $4,000 to $5,000. By 1995, core notebook technologies such as storage and screens went from being scarce and expensive to being plentiful and cheap. Once that happened, more vendors, particularly Taiwanese manufacturers, came to market with credible notebooks.

How to choose?

The average IS manager who purchases and supports mobile computers is left with a surprising, and often confusing, number of choices. The biggest challenge is how to assess the crop of "value" notebooks vs. their more expensive cousins, the "premium" products.

Today's value products use technology that was hot a year ago, but their performance is good enough for many mobile users.

For example, this year's value product is powered by a 75- or 100-MHz Intel Corp. 486DX4. A premium notebook uses the current hot processor (1995 marked the end of the DX4 and the beginning of the Pentium Age in notebooks).

It also features the latest, brightest and largest thin film transistor color-screen panel, the largest hard drive, a modular CD-ROM drive and features such as MPEG (software or hardware) video and high-end integrated sound subsystems.

A value product in today's market would include Toshiba's Satellite T-2130; an example of a premium product is IBM's ThinkPad 760. The price differences are $1,799 to $3,500 for value products vs. $4,000 to $10,000 for premium products.

What we're seeing is a real compression in the delta between value

Notebooks, *page 80*

The omnipresent, opulent notebooks

CONTINUED FROM PAGE 79

and premium notebooks. By the middle of the year, 75-MHz Pentiums will be running in value notebooks and the premium versions will run the 100-MHz-plus chips. In mid-1994, the value notebook was no longer just a has-been product with old technologies that forced a user to accept slow performance. The value notebook became very acceptable for the bulk of a company's mobile workers.

IS managers who want to leverage value notebooks have found that the introduction of Windows 95 means the code base for the market's volume operating system essentially is frozen for three years. IS managers don't have to be too concerned that an operating system upgrade is waiting around the corner to soak up the processing power in their mobile systems.

But premium-system envy, like my Porsche envy, will creep in. IS managers must apply a form of computing tough love to those who mistakenly think they need a $6,000 notebook. Precious few employees will require, or can justify, having MPEG-2 and stereo sound built in to their notebooks. Those who can justify a need for those features will be sales and marketing executives responsible for "selling" their company to investors or potential joint-venture partners. Sales personnel who sell products based on specific physical characteristics that require a visual demonstration also need premium notebooks.

"Like" and "need" are very different words. At the risk of sounding uptight, in today's competitive world — where holding down costs is a requirement, not an objective — they're the two words IS managers need to use within the context of notebook purchases. ■

McGuire is a mobile computing analyst at Dataquest, Inc. in San Jose, Calif.

NOTEBOOK ROUNDUP

Here's a sampling of some of the leading notebook vendors and overall vendor market strategy with commentary by Matt Sargent, industry analyst at Computer Intelligence InfoCorp in La Jolla, Calif., and specific product commentary by Randy Giusto, a senior analyst at International Data Corp. in Framingham, Mass.

VENDOR	PRODUCT LINE	MATT SARGENT SAYS	RANDY GIUSTO SAYS
Apple Computer, Inc. Cupertino, Calif. (800) 776-2333 http://www.apple.com	PowerBook 5000—premium PowerBook 190—value	Probably won't grow at the same rate as the rest of the notebook industry. There's been some question [about] their ability to get products to market.	Strength—Mac OS cohesiveness with applications. Weakness—Low perception as a technology leader (PCMCIA, large displays, etc.)
AST Computer Irvine, Calif. (800) 876-4278 http://www.ast.com	Ascentia—premium Advantage Explorer—small or home office	The Ascentia has made really good press [in terms of] overall quality of the machine and its engineering. Lately, AST notebooks have lost shares to Dell.	Strength—Samsung relationship brings lower-cost advantages (components, manufacturing and design). Weaknesses—Inability to estimate demand, increased competition within reseller channels.
Compaq Computer Corp. Houston, Texas (713) 514-0484 http://www.compaq.com	LTE 5000—premium Contura—value	Compaq is somewhat similar to AST. It was very late in having a Pentium model available, while a lot of vendors are taking off with what I call "super notebooks."	Strength—On vendor-approved lists due to desktop strength. Weaknesses—Slow in updating products; LTE 5000 product backlogs; aging Contura line contributes to falling market share.
Dell Computer Corp. Austin, Texas (800) 613-3355 http://www.dell.com	Latitude XPi—premium Latitude LX—value	Very well-recognized system within the marketplace. Lots of positive feedback, and it has done an incredible job working its way into corporate accounts. [Dell has] taken shares away from AST and IBM.	Strength—Has firm lock on corporate notebook market; plays to corporate price points and delivers best of breed. Weakness—Can't expand value notebooks through retail.
Digital Equipment Corp. Maynard, Mass. (800) 722-9332 http://www.dec.com	HiNote Ultra—premium HiNote—value	Very well-engineered systems. Their distribution seems to be lacking in the overall acceptance as a mainstream computer. It just doesn't seem to be there.	Strength—Product design. Weakness—Product availability problems in the past stunted market share growth.
Gateway 2000, Inc. North Sioux City, S.D. (800) 846-2000 http://www.gateway.com	Solo—premium Liberty—value	Liberty line isn't very successful. The Solo is a full-featured notebook that fits the Gateway buyer a little more. The Gateway buyer is really high-end and wants to have all the bells and whistles on the machine.	Strength—Similar approach to the market as Dell, perceived as offering solid value. Weaknesses—Slow to update products; limited international success for portables.
Hewlett-Packard Co. Palo Alto, Calif. (800) 752-0900 http://www.hp.com	OmniBook 5000—premium OmniBook 5000 VL—low-end Pentium line	They're a quiet competitor. HP's done very well in the desktop arena, and they've leveraged some of that advantage into some of their business accounts.	Strength—On vendor-approved lists due to desktop/server strengths. Weakness—Slow to update products.
IBM PC Co. Somers, N.Y. (800) 426-2968 http://www.ibm.com	ThinkPad 760—premium ThinkPad 365—value	ThinkPad is a high-end notebook for the person who wants everything. IBM's really pushing the ability to put everything on desktop into a notebook, and obviously a lot of people are willing to pay for that.	Strength—Perceived as a technology leader in display, design, video, etc.; strong brand image. Weakness—Inability to estimate demand hurts growth of market share.
NEC Technologies, Inc. Mountain View, Calif. (800) NEC-VERSA http://www.nec.com	Versa 4000—premium Versa 2000—value	NEC continues to hold the market share that they've always held in the notebook area. So, they have good innovation, but they haven't broken out of their current mold.	Strength—Internal sourcing of components provides cost advantages; successful channel expansion led to higher market share last year. Weakness—Inability to estimate demand resulted in product backlogs.
Texas Instruments, Inc. Dallas, Texas (800) 848-3927 http://www.ti.com	TravelMate—premium Extensa—value	The TravelMate's basically an older line that's done fairly well. The Extensa is a great system at a very low price that accumulated a huge market share in its first few months in the marketplace.	Strength—Major channel expansion completion has led to huge gains in market share. Weakness—Inability to forecast demand has led to product backlogs.
Toshiba America, Inc. Irvine, Calif. (800) 999-4273 http://www.toshiba.com	Tecra 700CT—premium Satellite Pro 410CS—midlevel	Toshiba's value line is still the leader overall—technically the standard for the industry. They're going to see increasing competition from TI and several other vendors.	Strengths—Builds configurations to specific price points; knows its customers better than any other vendor. Weakness—Inability to forecast demand for premium notebooks has led to backlogs.

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The 120% solution

Review: The 120-MHz Pentium notebook is the new leading edge for sales reps and CEOs

By Kevin Tolly

Have you made your shopping list for your next notebook computer? How does a Pentium-powered Windows 95 machine sound? It would be nice if it had a color screen, 8M bytes or more of RAM, a lithium ion battery, PCMCIA slots and a comfortable, Macintosh-style recessed keyboard with a palm rest. If that's as choosy as you're going to get, you would be pleased with any of the five high-end notebooks we reviewed this time out.

If your desires are any more specific, you'll need to take a much closer look. Surprisingly, across the five products and more than 50 evaluation points, the "lowest common denominator" features, such as those mentioned above, were few and basic indeed. The differences were more than subtle. And the winners and losers seesawed. Each of the five products landed in the "best" category at least once. Three of the five also managed a "worst" designation at least once.

METHODOLOGY *Computerworld* commissioned The Tolly Group to evaluate high-end Pentium notebook computers that run Windows 95. A dozen vendors were approached. Products from five vendors are reviewed here. IBM and Compaq were unable to provide products in time for this review. Several other vendors didn't respond to our inquiries.

We looked at more than 50 characteristics of each of the notebooks, including core areas such as CPU speed and video; untethered computing features, such as battery type and power management, multimedia support; basic performance; and value.

Given the different configurations and power-management options provided by each vendor, there was little point in running direct battery-life comparisons. It should be noted that these machines consume a lot of energy. Power-conservation options will have the biggest impact on battery life. Cross-country fliers should buy a second battery.

	Best vendor(s)	Description	Worst vendor(s)	Description
Pointing device	Gateway, NEC, TI	Touch pad	Dell	Trackball
Maximum hard drive	Dell, Gateway, Toshiba	1.2G bytes	TI	540M bytes
Modularity	NEC, TI	Bay for CD, floppy, second battery or second hard drive	Dell	No modular components
Tutorial and documentation	NEC	On-line multimedia	Dell, Gateway, TI	Hard copy
Advance power utilities	Dell, NEC, TI, Toshiba	Very granular control over power	Gateway	No control
Integrated CD-ROM	Toshiba	4x modular	Dell	No CD-ROM
Audio support	NEC	16-bit Sound Blaster, speakers and microphone, volume control	Dell	No audio support
Service and warranties	NEC, Toshiba	3-year standard and extended offerings	TI	1-year limit, no extended offerings

Vendor: Dell Computer Corp.
CPU: 120-MHz Pentium
Video: Super VGA active-matrix color
RAM: 16M bytes
Disk: 1.2G bytes
Price as tested: $4,899

Dell XPI [illegible]

Comments:
This is a great product, but it's about a year too late. For all its speed and high-capacity disk, it is missing too many critical features for the unit to be considered state-of-the-art.

On the upside, the system core is as good as they get. The processor speed and hard-disk capacity are top-notch.

The battery is cutting-edge lithium ion, and Dell provides a utility that gives the user very granular control over power-conservation options.

The active-matrix color screen produces crisp images. And the Dell machine booted up Windows 95 faster than any of the other machines.

However, if multimedia is your game, cross the XPI off your list. The unit doesn't offer integrated multimedia support, and Dell didn't present it to us as a true multimedia machine.

The vendor sells a PCMCIA Sound Blaster.

But why should you have to waste a precious PCMCIA slot for something that every other vendor tested provides as part of the base system?

One could buy a third-party CD-ROM and connect it to the notebook via a PCMCIA-based SCSI card or a parallel-port SCSI, but that adds significant expense, inconvenience and bulk to one's travel kit.

The physical design also leaves a lot to be desired. Instead of a new touch pad pointer, the XPI has an older-style trackball.

Worse, the system wasn't designed to be modular.

There's no utility bay that could be used, say, for a CD-ROM, floppy disk drive, extra battery or extra hard disk.

Thus, the buyer has no flexibility of configuration.

Finally, an infrared serial port, which suddenly seems to be de rigueur with high-end notebooks, is conspicuous by its absence on the Dell machine.

Gateway [illegible]

Comments:
The Solo is an outstanding machine. It's packed with all the latest and greatest features and has the best software bundle to boot. Its high "price as tested" is largely the result of the extra 32M bytes of memory (about $2,400 of the cost).

The Solo offers the latest in hardware innovation. Its core features of 120-MHz processor, 1.2G-byte hard disk and VGA active-matrix screen can't be beat.

The recessed keyboard (with a palm rest) is comfortable and is outfitted with a touch pad. Its on/off switch is configured by default to be a "suspend" switch so you'll rarely need to go through the reboot process.

In support of the untethered user, the unit employs a lithium ion battery. It has a rear-mounted infrared port and, like most of the other notebooks tested, comes with the Puma Technology "Transit" infrared file-transfer and print utility.

The Gateway is a superb multimedia machine. It boasts an integrated dual-speed CD-ROM. The same bay can be used alternately to hold a floppy disk drive.

The audio support is Sound Blaster 16-bit-compliant, and the unit is outfitted with a pair of stereo speakers and an external volume control. To interface with external sound sources, the unit has line-in, headphone and microphone jacks.

The performance profile is virtually the same as those of the other 120-MHz machines. The extra memory Gateway included didn't seem to be a factor. One could likely run the notebook

Vendor: Gateway 2000, Inc.
CPU: 120-MHz Pentium
Video: VGA active-matrix color
RAM: 40M bytes
Disk: 1.2G bytes
Price as tested: $5,999

with 16M bytes of RAM, save a lot of money and get perfectly satisfactory performance.

The Gateway comes with valuable, usable software. Microsoft Corp.'s Office and AutoMap/Road Atlas are preloaded, and CD-ROM copies are included.

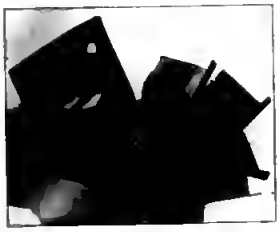
The vendor also states that Ascend (a contact manager) and Online Airline Guide are bundled, though these are only trial versions. Even with all these features, the machine still is svelte. The Solo is one of the smallest and lightest of the notebooks tested.

I can find only one negative — power. The Solo is devoid of power-conservation utilities. Using the Windows 95 control panel, you can set the LCD to shut off after a period of inactivity. But when it comes to things such as hard-disk shutdown, reducing CPU speed and turning off power to PCMCIA ports, the user has no control.

Unlike most of the other vendors, Gateway uses the more power-hungry 3.6V processor. With these features combined, the Solo will likely leave its user solo if he tries to work from the battery for very long. I hope Gateway can remedy this soon.

Finally, the keyboard has two special keys for Windows 95. Pressing one key is equivalent to a left click on the "Start" icon; pressing the other emulates a right click.

After using the machine for days, I still found it easier to use the touch pad. However, the vendor can rightly claim that this unit was designed for Windows 95.



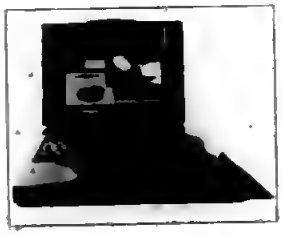
Vendor: NEC Technologies, Inc.
CPU: 120-MHz Pentium
Video: Thin film transistor color, 800 by 600 pixels
RAM: 16M bytes
Disk: 1G byte
Price as tested: $5,499

NEC Versa 4080H

Comments:
The Versa bills itself as a multimedia notebook and delivers on its promise. Like the Gateway, it has every bell and whistle one could imagine. The system consists of a 120-MHz Pentium, 1G-byte disk, touch pad and a thin film transistor active-matrix screen. This screen has a resolution of 800 by 600 pixels and renders crystal-clear images. It employs a VersaBay modular approach that allows for one of the following to be added: CD-ROM, floppy disk drive, second hard disk or second battery. The documentation isn't only "on-line," but it is a multimedia presentation itself. Nice job.

The unit is powered by a lithium ion battery, and the user is given great control over power conservation. Different profiles are set in the BIOS setup routine and can be invoked quickly from the "PowerPanel" tool bar that floats on the desktop. Not only does this unit offer infrared serial support, it offers the user a choice between using a front- or rear-mounted port. The port can be selected quickly from the PowerPanel tool bar. The multimedia support is first-rate. The integrated dual-speed CD-ROM is paired with an internal Sound Blaster 16-bit compliant audio feature. The Versa sports the largest array of audio interfaces, line-in, line-out, microphone and headphones. And it sports an external volume control.

It's hard to find much wrong with the Versa. It's a nuisance that you have to go to the BIOS setup to change power profiles, but most users won't have to go there very often. The biggest problem is the battery. Unlike the other products we tested, the NEC battery isn't molded to slide into the side of the unit. The free-standing battery is held to the bottom by a trapdoor. Replacing the battery is awkward, and doing so on a plane is sure to delight your seatmate. Finally, the hard disk whirs at a high E-flat. Who cares? You will if you try to use the integrated microphone to record anything. The disk sound is so prominent that it makes the integrated microphone useless.



Vendor: Texas Instruments, Inc.
CPU: 75-MHz Pentium
Video: dual-scan (passive) color
RAM: 16M bytes
Disk: 524M bytes
Price as tested: $2,999

TI Extensa 580CD

Comments:
The TI Extensa offers good value for the money, but it isn't in the same league as the Gateway, NEC or Toshiba notebooks. Most important is the improvement the Extensa brings over TI's previous TravelMate line. Ironically, the TravelMate offers a 120-MHz Pentium that isn't yet available in the Extensa. However, buyers would be advised to forego the faster, older-style machine, and go with the Extensa. It's only a 75-MHz machine, but the Extensa matches many of the features of the 120-MHz multimedia machines.

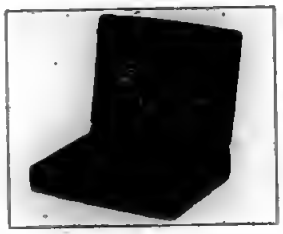
It sports a touch pad (with rather stiff buttons), a recessed keyboard and a palm rest. Unlike the other products tested, the Extensa offers a passive dual-scan color screen, which reduces its cost. The unit employs a bay that can be used for a CD-ROM, floppy disk or second battery. An infrared port is at the rear of the unit.

The unit we received had a nickel metal hydride battery, but the literature says that the more desirable and more expensive lithium ion battery is available. Power-conservation options are limited to three profiles and control only the disk, CPU and video. On the multimedia front, the Extensa has all the basic necessities: integrated dual-speed CD-ROM and Sound Blaster 16-bit compatible audio.

The Extensa, unfortunately, comes up short in some important areas. First, the largest hard disk available checks in at 524M bytes. That simply isn't large enough for a Windows 95-based high-end machine. After Lotus Development Corp.'s Notes 4.0 and Microsoft Corp.'s Word 7.0 (and no other Microsoft Office applications) were loaded, only 186M bytes of disk remained. Buyers of this machine will need to install disk-compression software on Day 1 of ownership.

It has no external controls for screen brightness or audio volume. One has to stare at the keyboard for a while before detecting the "Fn+" brightness and audio volume keys. The brightness keys work; the mono audio doesn't get any louder than a whisper, even after you click the "louder" function key combination a dozen times.

Performance was naturally a bit more sluggish in the 75-MHz model, but still was quite good. Where the 120-MHz models took 13 to 17 seconds to load Notes, the Extensa required 20 seconds. Similarly, bringing up Word required 6 to 7 seconds for the 120-MHz models and 9 seconds for the Extensa.



Vendor: Toshiba America Information Systems, Inc.
CPU: 120-MHz Pentium
Video: Thin film transistor color
RAM: 16M bytes
Disk: 1.2G bytes
Price as tested: $5,699

Toshiba Tecra 700CT

Comments:
The Tecra, like the Gateway and NEC offerings, is a top-notch multimedia machine. The litany is the same as before: 120-MHz, 1.2G-byte hard disk, thin film transistor, active-matrix color screen. As expected, the screen displays colors quite brilliantly. It sports a recessed keyboard with palm rests and a modular bay for a CD-ROM or floppy drive. It's different from the other products, because the default way to connect a floppy is via an external cable. A rear-facing infrared port is standard.

The battery support is outstanding. It starts with a lithium ion battery that conforms to the outline of the notebook shell and can easily be swapped without a major commotion.

The power-conservation options are very granular and allow the user quick, real-time access via the MaxTime Toshiba utility. Conservation also can be invoked when running under AC power.

The Tecra can brag that it has the best multimedia support. It's the only unit we tested that offered an integrated quad-speed CD-ROM. For general business functions, the quad-speed might not matter, but for multimedia, it is a consideration. It is outfitted with Sound Blaster 16-bit compatible audio, integrated stereo speakers (with top-mounted volume control) and ports for a microphone and headphones. It also comes with CD-ROM control utilities and an MPEG player.

There isn't much to complain about here. The Tecra is relatively large and heavy, but there's so much packed into it that the bulk is understandable. My only reservation about the unit is its lack of a touch pad. It makes use of an old-fashioned Accupoint pointer. But because a pointing device is really a personal preference, one shouldn't consider this a major knock.

Tolly is president of The Tolly Group, a testing firm in Manasquan, N.J. The firm will post the methodology and complete results of this review at http://www.tolly.com.

Maturing notebooks now measured by PC standards

By Kevin Burden

Remember when the right weight, battery life and keyboard size were enough for a notebook computer to attract hordes of users? Those issues still are important, but notebooks have matured — they're now scrutinized on the same criteria as PCs.

We asked 278 managers who purchase notebooks, "What's the most important criteria in your selection of a notebook?" The most common answers: screen quality and performance comparable to desktop models. More specifically, for Apple users, it was usability; reliability was critical for users of Compaq, Dell, IBM and Toshiba notebooks. NEC users are looking for a good price. Which vendor keeps its users happiest? Compaq won "very good" overall satisfaction ratings from almost half its users.

OVERALL SATISFACTION

	Very good	Good	Average
Apple (39)	38%	46%	13%
Compaq (53)	45%	43%	11%
Dell (51)	37%	51%	6%
IBM (50)	40%	48%	10%
NEC (35)	31%	60%	8%
Toshiba (50)	40%	48%	8%

Percentage of users. ( ) indicates total users interviewed

What we did...

The goal of the survey was to find out what requirements companies had when choosing their notebook vendor and how well their notebooks perform in those critical areas. To do this, *Computerworld* contracted First Market Research in Austin, Texas, to contact a minimum of 30 users per notebook vendor. The six most commonly stated criteria for each vendor are listed in the charts. The numbers in the charts represent users who rated the notebooks "good," "very good" or "average."

Scores represent favorable ratings by buyers of criteria that is important to them. Negative scores were insignificant.

	Very good	Good
Usability	4	12
Reliability	6	5
Maintainability	4	6
Compatibility with desktop	0	10

Apple's usability wins loyalty

Ask Apple users why they choose PowerBooks (or Macintoshes), and they first cite usability, as our survey reaffirms. Users of Compaq, IBM and Toshiba machines also listed usability as important in choosing a vendor, but Apple had the most users ranking usability "very good" or citing it as the top reason for their notebook choice.

Most of the six criteria that were ranked most important relate to Apple's engineering and overall packaging of the PowerBook. CPU speed is the only performance issue Apple users deem highly important, but the PowerBook's CPU speed didn't score well in terms of user satisfaction; it earned only a handful of "very good" votes. According to the scores, users see the PowerBook as a reliable and easily maintained notebook that is compatible with their desktop environments.

"We need our people in the field, working just as they would at their desks," says Kate Monteiro, computing manager at Brown University in Providence, R.I. The university's desktop environment is all-Macintosh.

	Very good	Good
Reliability	5	14
Compatibility (nonspecific)	5	8
Usability (nonspecific)	5	3
Compatibility with desktop	6	2

Compaq leverages reputation

Compaq users are like Apple users; they are concerned about nontechnical issues. They want their notebooks to be reliable. This finding is consistent with a survey that *Computerworld* conducted last November; in that survey, Compaq desktop users put reliability first on their lists.

Compaq has "a reputation of making strong, dependable products, which we feel is a good trait [on which] to base a decision," says Lisa O'Dell, electronic data interchange manager at Farmland Foods, Inc. in Kansas City, Mo. Compaq had the most users who rated their equipment's reliability as "very good."

General compatibility also is a priority for Compaq users. And of six groups of users, only Compaq users ranked support as being "critical." Holding everything else equal, Compaq's "reputation and quality of service made our final decision," says Lee Weixelbaum, data services manager at Lifelink Foundation, Inc. in Tampa, Fla.

In overall satisfaction, Compaq had the most users awarding "very good" grades to its notebooks.

	Very good	Good
Reliability	5	12
Price (nonspecific)	7	7
CPU speed	5	4
Negotiated price	4	2

Reliability, price key for Dell

Dell users want reliable and rugged notebooks at better than competitive prices. Dell notebook users — like Dell desktop users — proved to be among the most price-sensitive in this evaluation.

"[Dell] came in with the lowest price out of the vendors we looked at," says Roger Erickson, systems manager at British Petroleum Chemicals, Inc. in Cleveland. Erickson says the company got the price it wanted by negotiating a bulk order.

But shopping on a budget doesn't mean you sacrifice quality, Dell users say. They are concerned with many of the same issues that are important to other notebook users in this survey, and they grade Dell just as highly.

Compatibility and CPU speed are areas where Dell scored well. Users cited those areas as the major reasons for their buying decisions; users rated their satisfaction with both categories higher than what other notebook vendors posted.

Compatibility isn't among the top four criteria for Dell users, but it ranked fifth in importance and was praised by 13 Dell users.

	Very good	Good
Reliability	6	11
CPU speed	3	5
Quality of color images	2	4
Screen (nonspecific)	4	4

IBM shows technical strength

IBM customers showed the greatest interest in raw technology. Sharp text displays, rich colors and overall screen quality were listed as top reasons for choosing an IBM notebook. "The resolution is crisp and clear. Its active-matrix screen really brings video to life," says Steve Gimse, telecommunications manager at Speed Queen Co. in Ripon, Wis.

IBM users also are attracted by CPU speed. They rated it second in importance, which makes speed slightly more important to them than to users of other vendors' notebooks.

Reliability also is important, more so than all other categories. Our survey didn't turn up any complaints about product failures or faulty components; most gripes involved price. "We distribute these [notebooks] around the world, so we paid a lot of attention to reliability when [we made] our decision," says Luke Voltz, manager of data center operations at Neutrogena Corp. in Los Angeles. "We just wish IBM could be more lenient on the price."

	Very good	Good
Price (nonspecific)	7	2
Quality of color images	2	5
Compatibility (nonspecific)	2	4
Construction of chassis	5	1

NEC's edge comes in price

NEC is competing in an area that has made vendors such as Dell very successful. Price is the top reason users say NEC is their notebook vendor.

"We looked at several top vendors with reliable systems that would withstand the beatings of travel," says Steven Dietz, network manager at the U.S. Environmental Protection Agency. "So in the end, price made our decision." But don't expect to be wooed by NEC's list prices. "We had to negotiate before we got our price," Dietz says.

And like IBM customers, NEC users are particularly attracted by bright, slick screens. "The visibility and color resolution is the best out of what we tested," says Larry Lawhon, purchasing manager at EER Systems, Inc. in Seabrook, Va.

Reliability just made the top criteria, but it didn't score as positively as other vendors on the Scorecard. Only five users gave NEC's reliability positive marks; only two scored it "very good." Users complained about frequent trackpad failures, telephone jacks that broke and a quirky screen hinge that became dislocated.

	Very good	Good
Reliability	5	8
Negotiated price	8	2
Hard disk capacity	5	3
Quality of color images	2	6

Toshiba users talk dollars

Users look to Toshiba for technology leadership; that is why it ranked high in categories related to technology performance.

Only Toshiba users listed hard disk capacity among their top decision influences. "I would rate it 'very good' if they could improve the speed [of the hard drive]. But having one [gigabyte] of space is outstanding," says Bill Zavis, network manager at Equity Residential Properties, Inc. in Chicago.

Color quality and CPU speed also made the critical list and scored well. But if one should be improved, users say it should be speed before screen quality. Speed received only one "very good" grade; the rest of the field rated it "good."

Several users complained about list prices. "Prices are still too high unless you're buying high quantities," says Clifton Robinson, systems manager at San Antonio's City Public Service Board. But Toshiba is willing to negotiate, users said. Users ranked price negotiation as the second most important reason why they chose Toshiba.

F.Y.I.

Sources for additional information on notebook PCs and portable computing in general

BOOKS

Using Wireless Communications in Business, Andrew Seybold, Van Nostrand Reinhold, 1995

Maintain and Repair Your Notebook, Palmtop or Pen Computer, Windcrest/McGraw-Hill, 1994

CONFERENCES

Telecommuting '96
April 25-26
Jacksonville, Fla.
The Barnett Institute
University of North Florida
4567 St. John's Bluff Road So.
Jacksonville, Fla. 32224-2645
(904) 646-2875

Wireless Apps '96
Oct. 28-30
Cellular Telecommunications Industry Association
1250 Connecticut Ave. NW
Suite 200
Washington, D.C. 20036
(202) 785-0081

TRADE SHOWS

Comdex/Spring '96
June 3-6, Chicago
Softbank Comdex, Inc.
Needham, Mass.
(617) 433-1500

PC Expo
June 18-20, New York
Blenheim Group USA, Inc.
3 Executive Drive
Fort Lee, N.J. 07024
(201) 346-1400

OTHER SOURCES

"Road Warrior News"
Free electronic newsletter
http://warrior.com
(800) 274-4277, ext. 730

Mobile and Wireless Computing World World Web Library http://snapple.cs.washington.edu/mobile
This includes index and pointers to conferences, references, papers, groups, products

MobilePlanet Home Page
http://www.mplanet.com
Here you'll find on-line catalog, press releases, great buys, new technology

BATTERIES

Nickel cadmium batteries are on the way out. **Nickel metal hydride** is pretty standard, and **lithium ion** is leading-edge.

Those are the three core battery technologies found in notebook computers.

But vendors are promoting enhanced implementations of those types or totally new approaches such as **zinc air** and **lithium polymer**.

Nickel metal hydride has taken its place as the basic notebook offering. But vendors also offer lithium ion — which packs more power — for an additional cost.

Randy Giusto, an analyst at International Data Corp., notes that one twist on older technology is the development of "smart batteries."

These enhanced nickel metal hydride or enhanced NiCad batteries were designed to give users accurate readings of battery status and to overcome the long-running NiCad "memory problem."

If NiCads aren't totally discharged before they are removed for recharging, the batteries remember the last recharge point and believe they are empty when they reach that point again.

Some notebook and battery makers are promoting standardized smart batteries that can be used in a variety of computer and consumer products.

Giusto says many vendors have resisted the concept because they don't want to let battery shape and size dictate their system design.

He says that while batteries today produce more power, advanced technologies such as Pentium chips and multimedia are draining them at a faster rate.

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In the Mind of

'MOST WANTED'

Hacker, Kevin Mitnick

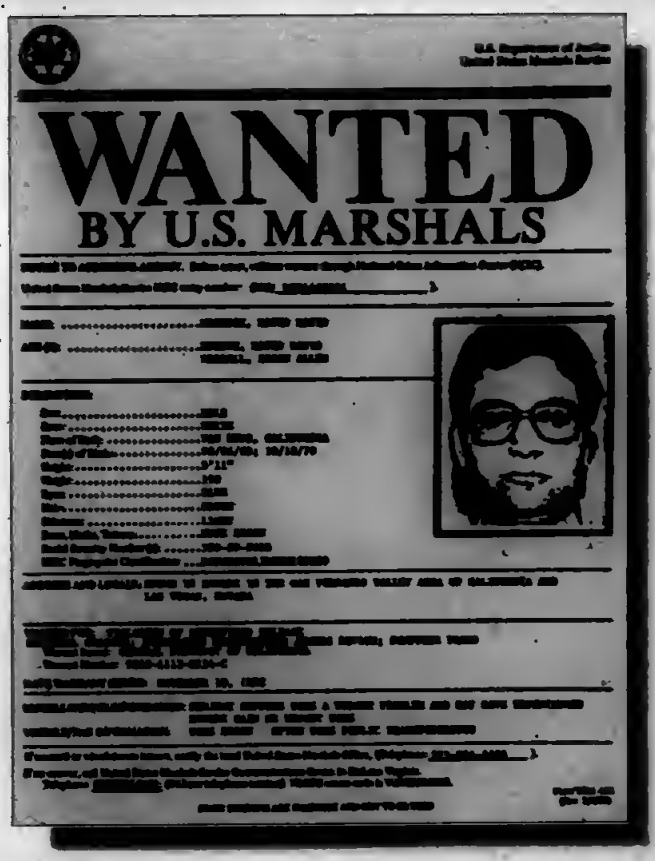
By Jonathan Littman

Kevin David Mitnick personifies the hacker as sociopath. His exploits — legend has it he penetrated the North American Air Defense Command as a teenager — are said to have inspired the movie *War Games*. Even the most heavily guarded networks and highly touted security experts have been no match for Mitnick's unique double-barreled shotgun of technical savvy and old-fashioned con artistry.

Mitnick has toyed with long-distance switching networks, pirated the Internet and cellular telephone companies at will and jousted with those he considers foes. In 1982, Mitnick became a federal fugitive and led the Federal Bureau of Investigation on a wild, international chase.

Mitnick's celebrated hacking spree and capture in February 1995 made front-page news around the world. Yet the crimes and motivations of the FBI's "most wanted hacker" remained shrouded in myth. Mitnick had never talked to a journalist.

But nine months before his capture, the 31-year-old Mitnick began to call Jonathan Littman, a freelance journalist in San Francisco who has written numerous articles about cyberpunks. What follows are selected excerpts from some of the dozens of conversations between Mitnick and Littman while the hacker was on the run.



BOOK EXCERPT

From *The Fugitive Game: Online With Kevin Mitnick* by Jonathan Littman, to be published this month by Little Brown & Co., Boston. Copyright 1996, Little Brown.

Talking to Kevin Mitnick is like channel surfing. He skips from topic to topic, sometimes interrupting himself midsentence. But nearly everything he says is intriguing, especially when you consider he's wanted by the FBI.

"Why do you think they've tried to make you this incredible . . ."

"Bad guy? Monster?

"Because it's easier to do anything they want with you if they make sure the public has that view. Then no one gives a sh-t.

"On the other hand, I don't consider the acts I'm accused of being heinous. There's no money I've stolen. Nobody made a profit."

"Acts you're accused of?" I repeat.

"Things that I'm accused of that they mention in the papers [copying the source code for cellular phone service, wiretapping FBI agents and attempting to social engineer, or con, Department of Motor Vehicle officials], I'm not commenting one way or another. I'm just saying, if they were true or not, I don't think it's public enemy number one material."

Maybe Kevin Mitnick misses his lost childhood

Kevin Mitnick, *page 88*

Kevin Mitnick

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and wishes he could change, but he still loves to hack. He's just finished telling me how he wishes he'd never seen a computer. Now he's telling me why he can't resist temptation.

"People who use computers are very trusting, very easy to manipulate. I know the computer systems of the world are not as safe as they think," Mitnick proclaims proudly. "Information is not safe. Only military computers are secure."

Mitnick worships technology.

"I believe it's fascinating, the marvel of communications and technology. A little palmtop that can store masses of data or do intense calculations. The ability to walk down the street and talk to someone at the other end of the world.

"I have the ability to find anybody I want to find. I'm very good at what I want to do. I was teaching [private investigators]. They were amazed. High-tech PI firms aren't what they're cracked up to be. They go and pay somebody off at the DMV or at the IRS. They grease the palm. I do it with a laptop and a cell phone."

Mitnick's revved up, jumping from thought to thought.

"It's been a unique learning experience. My philosophy, it's hard to explain. It's like a high-tech game, figuring out how to crack a computer. How to actually outwit opponents.

"It's a big game, but I could end up in the can. They're saying I'm John Dillinger, that I'm terrible, that it's shocking that I could get this awesome power. They can get away with whatever they want. It's like Saudi Arabian law."

"Why do you think the government is taking it so seriously?" I ask.

"They're afraid because the technology is new. They [the FBI] are not up on it. They are used to old-fashioned, stick 'em up crime. This is something new, something they can be violated with. They're scared of the new technology. They've convinced the public they are in great danger."

"So do you think you're a criminal?"

"No, I don't like to think of myself as a criminal. But if the technology laws are like Singapore, where it's illegal to chew gum," Mitnick sighs, "I guess I'm a criminal."

"I'm the type who's a master safecracker. I'd read your will, your diary, put it back, not take the money, shut the safe and do it so you never knew I was there. I'd do it because it's neat, because it's a challenge. I love the game.

"I guess you could paint me as an alcoholic. Five years ago, that's all I looked forward to, even in my marriage. I put my hacking above my work, my time with my wife, anything. At the time I knew I had this drive to do it, but I didn't think about it."

"What was the attraction?"

"The high. To beat the System. It's scary not knowing why you do something, but I didn't want to do anything else. I'm trapped. There's no escape."

"Which are the most secure systems out there?" I ask the world's most-feared hacker. "Are any of them secure?"

"If you're on the Internet, you're in trouble."

"OK. What about CompuServe?"

"No."

"America Online?"

"No."

"But they told me they're secure."

"Why don't you call the Well [a public access 'net site]?" Mitnick snips sarcastically. "You know the Well is secure. Use the Well. You don't like people reading your mail, do you?" Mitnick chuckles. "Why don't you just say, 'Hey, don't read my mail!' "

I ignore the taunt and ask more about Internet security. "It's funny because one of the larger Internet providers told me, 'No, only those smaller providers have problems. We're perfectly secure. And if you wanna be extra secure, we just won't list you in the directory!' "

"Maybe you should go with Netcom," Mitnick snickers.

It's an inside joke. Netcom is one of Mitnick's many personal cyberspace playgrounds.

"You don't feel this fear out there?" I ask. "What do you think could be done?"

"I don't know if it's real or not. I guess it's a real because who am I to say how someone else feels? But I think fear is played upon a lot, too."

"I had to go on business like six months ago, flying to D.C.," Mitnick begins, his voice bubbling with excitement. "So I actually went on the White House tour."

"You're kidding?"

"No! Could you imagine, all these Secret Service agents?" Mitnick chuckles at the irony. One of the Secret Service's jobs is to catch hackers. "They're in uniforms. It's weird they're not in, like, suits."

"So Cyberman goes to the ..."

"The White House, dude."

"I wanted to get some pictures taken, but I decided that was a bad idea.

"They didn't have much security," Mitnick observes. "Little did they know I was there to get into WhiteHouse.gov," Mitnick chortles, referring to Clinton's Internet site address. "'Hello, I just wanna see the computer room, guys.'"

"They're on the 'net, right?"

"WhiteHouse.gov. That's the one that's secure," Mitnick deadpans. "I'm just kidding. Any computer is insecure unless you're military."

Mitnick's finally talking about how he could hack his first million, that is, if he were just a cybercriminal and not a dedicated hacker.

"Theoretically, what could one make money

Kevin Mitnick, page 89

Kevin Mitnick

CONTINUED FROM PAGE 88

with?"

"Information," Mitnick says weightily. "Insider trading."

Ivan Boesky, listen up.

"Let's say I wanted to make lots of money. Like right now I can get out of this f–ing bind that I am in. All's you've got to do is become a real criminal. Infiltrating companies that do leveraged buyouts and stocks and mergers. Obtain this information, create a new identity and do stock trades. Something that's not going to be so high profile that the Securities and Exchange Commission steps in. Like 50K here and 50K there."

"A lot of money," I say.

"Become another Ivan Boesky. That's easy. I can do it tomorrow, but that's where I don't cross the line. But if somebody wanted to do that, the key would be infiltrating the companies that do the leveraged buyouts.

"The buyout companies," Mitnick repeats. "The attorneys that do the buyouts."

"Which is probably easier?"

"You know they're not secure," Mitnick says. "Like, for instance, I hate saying names."

"Well, I'll say a name, like Lehman Brothers or . . ."

"Shearson Lehman. So you basically attack those companies, and I'm good enough, I can basically get in anywhere I choose. Like now, if I was a real desperado, that's what I'd be doing."

"Right," I say with a touch of disbelief in my voice.

Mitnick doesn't like my tone. "You know I'm not bullsh–ing you!" Mitnick snaps.

"Right. You just target somebody who has . . ."

"The information," Mitnick intones.

"Information." It's one of the hacker's favorite words, right after "idiot."

"There's always got to be one center that's more secure than the other," Mitnick continues, sounding professional. "They are just about to do a leveraged [buyout], and the value of the company's going to double in the next week. So you buy 10K [of stock], and it's worth 20K."

"Right, and then you sell."

"As long as you don't buy $100,000," Mitnick advises. "Maybe [you] establish a credit profile under it, and then you take that cash. You launder it. You deposit it in your real account under your other identity and in different increments. So in other words, you wouldn't take five grand out of that bank and the same day deposit five grand in your other bank.

"They have certain trip levels that notify the IRS. With the new database the government's going to do on America, they're going to keep track of everyone's banking finances. So you take out $2,000 and a few days later, make another $2,000 deposit."

"Big Brother doesn't watch if it's under $2,000?"

"Twenty-five hundred is the trip level," Mitnick explains. "Ten thousand is the big trip level, but banks also notify at $2,500. They actually have a database which keeps track of all these transactions — that's how they catch big drug traffickers."

"They do this on everybody?"

"What's the big deal? So it takes four times as long. It's basically free money," Mitnick says, suddenly wondering why he just told me this. "I'm telling you if I was a real thief, I wouldn't be toying around with cellular sh-t 'cuz there's no money in it!"

Mitnick continues. "What, so I'm going to modify a cellular phone and sell it to somebody so that person can go turn me in? If you're going to commit a crime, do it where there's no witnesses. And that's in this insider sh-t."

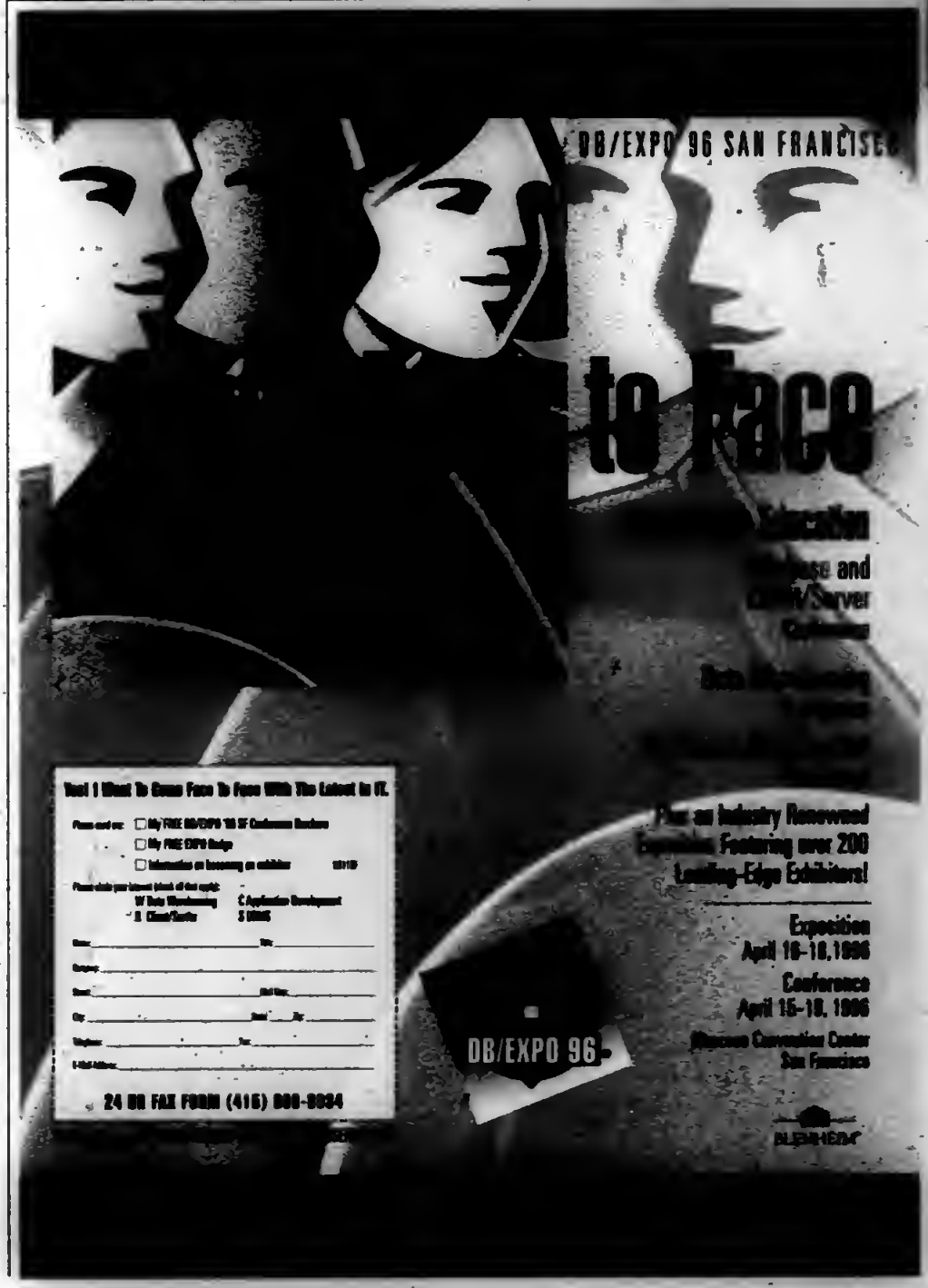
"What are the other theoretical methods that could be used?"

"Besides wiretapping?" the hacker says.

"Yeah."

"There's many different ways of wiretapping: social engineering, outside penetration. Computers can be broken into. If they're on the Internet, [they] might as well have a welcome mat." ■

Jonathan Littman is the only reporter to have talked directly with notorious hacker Kevin Mitnick during the nine months before his capture by the FBI.



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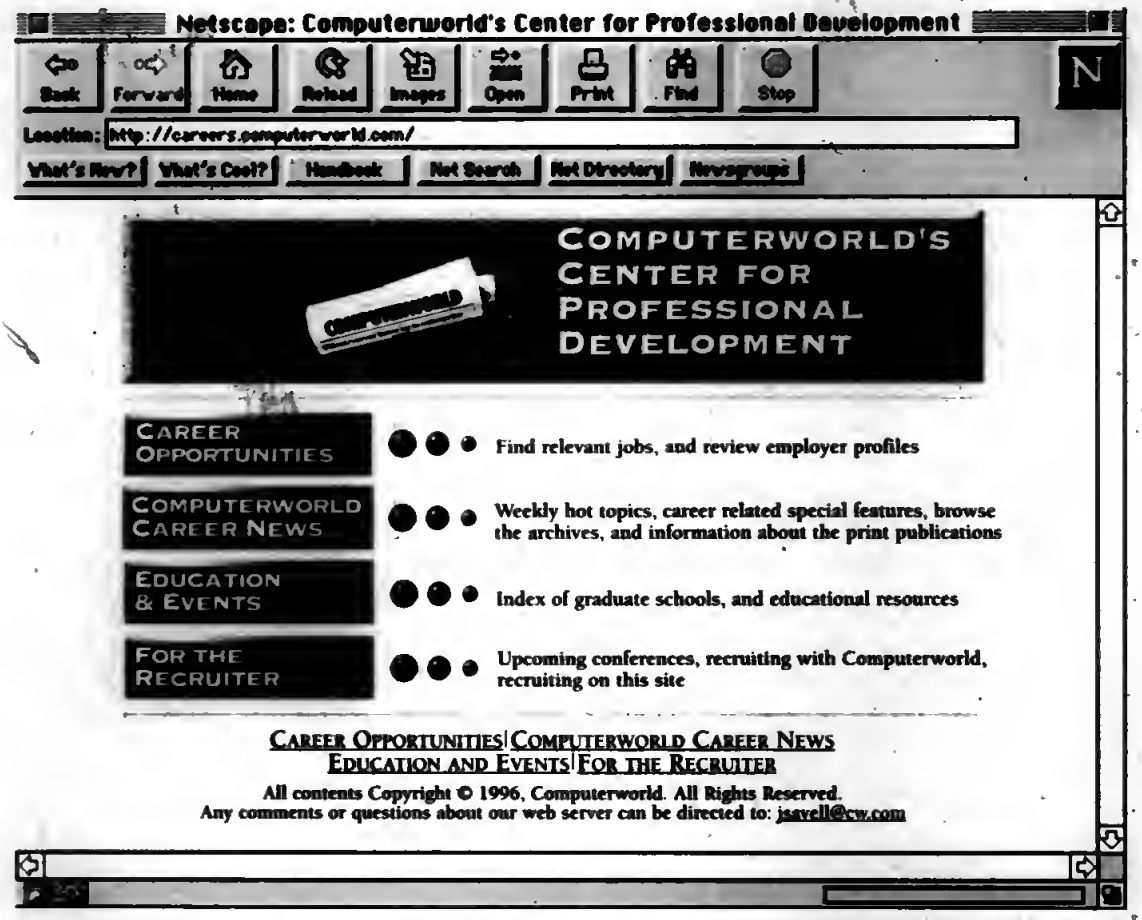

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Objects of the Game

Winning at object-oriented programming requires business, project and team-building skills, not to mention common sense

By Alan R. Earls

Some firms are still in the early stages of adopting object-oriented technology, but many other companies are racing ahead at full speed. Those firms are scooping up object-oriented people as fast as they become trained.

The result is that supply and demand are way out of balance, and salaries for skilled object-oriented professionals are skyrocketing. Most experts agree that object orientation takes time to learn well, which can mean months of training before even experienced people begin to produce results. So no one predicts a "correction" any time soon.

"The learning curve is more substantial than most people expect," says Jon Hopkins, director of object technology at Rational Software, Inc. in Santa Clara, Calif.

But if you can master the paradigm and get a language under your belt, the rewards can be substantial. Indeed, with head hunters, Big Six accounting firms, multimedia companies and traditional employers all churning the market, "six-figure incomes are becoming possible," says Don Hausknecht, a continuing education specialist in charge of computer science courses at the University of California at Los Angeles Extension program.

"To do this on a regular basis, people must be aware of many new things. They must be able to abstract and partition responsibility. It is not just a matter of understanding data but also mastering some other specific area — say, the credit-card business. The learning curve is more substantial than most people expect."
– JON HOPKINS, director of object technology at Rational Software

In demand

In the object-oriented arena, some skill sets are destined to grow in importance and others may fade. Fortunately, there seems to be consensus about which ones are most important now — C++ and Smalltalk — and strong opinions regarding which ones may emerge in the future — Java and object-oriented Cobol, for instance.

For now, demand is so great that, as Tim Budd, professor of computer science at Oregon State University and author of an object-oriented textbook puts it, "almost anything [object-oriented] is in demand by industry."

Object technology is as integral to the software field today as the slide rule was to engineering a generation ago. Object-oriented programming treats data and the programming affiliated with it as a coherent "object" with a host of behavioral parameters.

Optimally, object-oriented programs are supposed to be easier to reuse and maintain and more powerful and adaptable than programs produced with conventional approaches.

"To build a career in object technology, you need skills at the architectural level so you can understand enterprisewide development activities, and you need the programming skills to implement that," says Mark DiSalvo, CEO at Semaphore, a training company in North Andover, Mass.

Daniel Ervin, vice president at Semaphore, says C++ is still far and away the most important programming skill. He notes that an object-oriented version of Cobol released recently may become a hot area.

Indeed, Ervin says the technology has the potential to add a new dimension to the careers of traditional mainframe-oriented professionals.

"Using the mainframe as a server within a client/server environment will give traditional Cobol programmers the opportunity to grow into object-oriented Cobol and enjoy the benefits of client/server architecture," Ervin says.

Hopkins also endorses C++ as today's most crucial object-oriented skill but notes that there's a growing need for people who can develop project management skills within an object-oriented environment.

"To do this on a regular basis, people must be aware of many new things," he says. "They must be able to abstract and partition responsibility. It is not just a matter of understanding data but also mastering some other specific area — say, the credit-card business."

Hopkins says the very popularity of object-oriented technology and its application to more and larger projects augurs well for those able to see the big picture and apply an architect's vision along with technical skills.

"To build a career in object technology, you need skills at the architectural level so you can understand enterprisewide development activities, and you need the programming skills to implement that."
– MARK DISALVO, CEO at Semaphore

Monkey skills

Indeed, Gordon G. Miller III, director of the multimedia laboratory at Virginia Polytechnic Institute and State University in Blacksburg, Va., says, "The programming skills could be taught to a monkey." What is more challenging, he says, is mastering the overall logic and flow of information in a project.

Resources are available for acquiring skills in each of these areas, and many independent training organizations cover the object-oriented arena.

Several colleges and universities also are in the forefront. Most already recognize that, for undergraduates, object-oriented programming is the new lingua franca; some also offer evening courses or seminars for professionals.

And while objects are alien territory in some ways, those thinking of making the leap shouldn't feel they are sacrificing their accumulated experience and overall background. In fact, Hausknecht says, those experiences may pay off.

Those tackling object technology for the first time, he says, do better if they have a background in systems software development and some experience in the life-cycle costing and maintenance of software. ■

Earls is a freelance writer in Franklin, Mass.

Getting Your Hands on Object-Oriented Technology

There are many independent training organizations for those who seek object-oriented programming skills

- **GMS Corp., Houston,** provides training in C++, object engineering, object analysis, and design and implementation. Courses last several days. (713) 488-8806
- **The Instructive Set, Framingham, Mass.,** offers courses in object-oriented concepts, design, analysis and C++ and Smalltalk. Most of the training is for the corporate market, but the firm offers some public courses. (800) 874-6738
- **McCabe & Associates, Columbia, Md.,** provides training, mostly from its headquarters, and consulting based on its McCabe Tool, a proprietary development aid. (800) 638-6316
- **NetLinks Technology, Inc., Nashua, N.H.,** provides an introduction to object-oriented technology. This three-day workshop covers the Common Object Request Broker Architecture (CORBA) and CORBA-related design and development. (603) 891-4177
- **The Technology Exchange, Reading, Mass.,** *(a subsidiary of Addison-Wesley Publishing Co.)* focuses extensively on the object-oriented corporate training market and has more than 35 different courses in three areas: languages and operating systems, networking and systems software engineering. Most of the courses are in languages and operating systems. The Technology Exchange has held several public programs in the past, but the big growth is in the corporate training area. (800) 662-4282

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Requires 5-7 years' experience with 2 or more of the following skills: PC Hardware, Windows, desktop applications, and application interoperability, Visual Basic and communications protocols.

UNIX System Administrator

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Business Consultant. Duties: Manage Business Consulting Group. Utilize knowledge of software design techniques and regional business needs to recommend support systems to clients. Train consultant development teams in use of application development methods and systems architectural principles for computer consulting projects. Provide computer systems-related strategic planning, quality assurance reviews and information architecture planning services for business clients. Expand client base through marketing presentations and other sales support activities. Requires: B.S. in Comp. or Info. Science and 2 yrs. exp. in job offered or as Systems Engineering Consultant or Programmer-Analyst. Concurrent experience must include 2 yrs. exp. in infrastructure planning and development of data, application and technical architecture and 2 yrs. exp. using data, project and processes management tools, including: Project Workbench (Super Project Plus), Composer (IEF) and Accelerator (Irwin). EOE. 40 hrs/wk, 8:00 AM to 5:00 PM. Salary: $72,000/yr. Send resume (no calls) Ron White, Computer Task Group, Inc. 5730 Oakbrook Parkway, Suite 105, Norcross, GA 30093-1825.

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Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs; analyze, design & develop computer software for clients EDP systems; database administration & maintenance of Unisys A-series DMSII databases 2200 & U6000 systems; operations & technical support including troubleshooting of Unisys A-series COMS/DMSII, COBOL & ALGOL applications with system up time of 7 days-24 hrs. Unisys 2200 TIP/HVTIP/DMS1100 programming in COBOL, MAPPER programming in U6000/UNIX envir., design & develop on-line applications in financial, health care or insurance field. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronics Engg., Systems Analysis, Computer Applications, Computer Information Systems, Math or foreign equiv., 2 yrs. exp in job offered or 2 yrs related exp such as Programmer/Analyst, Systems Analyst, Software Engr, Consultant, Systems Engr. Or Lead Analyst. Related exp must include designing, developing, testing, supporting & maintaining Unisys A-Series, 2200 & U6000 systems & using COBOL, MAPPER, ALGOL, COMS, DMS II & DMS 1100. $48,000/yr., 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #02296 "Employer Paid Ad"

SENIOR ASTECH CONSULTANT. Responsible for providing technical support to customers. Resolve customer problems as required, provide on-site technical support; research problems and issues on behalf of customer; maintain customer's computer systems; reviews customer support requirements and provides solutions; analyze customer reported problems; perform support for customer requests while on-site; operate customer computer systems and support equipment as required by customer; write status reports to management and customers; travel to customer sites as required. Proven experience in Tandem system, utilizing TAL, Pascal, C, Cobol, Scobol and Assembly language; software analysis and design, software programming skills, BASE24 products. Testing procedures skills; WordPerfect and database management. Must have B/S, B/A in Computer Science. 40 hour/week. $45,000.00/year. Must have proof of legal authority to work in the United States. Send your resume to Bernard Childerston, Nebraska Department of Labor, P.O. Box 94600, Lincoln, NE 68509. Refer to job order #NE 0154117. This advertisement is paid by the employer.

Direct the activities of the City of Ft. Lauderdale's Technical Services section in the Information Systems Division.

Minimum quals are a bachelor's degree, preferably in a related field, plus 5 yrs experience managing large scale systems projects with at least 4 yrs in technical support encompassing executive software (preferably Unix), data base admin (preferably Informix), LANS and WANS. Add'l exp may substitute for education.

Salary range is $46,592 - $65,832 + liberal fringe benefits. Submit resumes to Personnel Division, 100 N Andrews Ave., Ft Lauderdale, FL 33301 by February 12, 1996. For more info call 305-761-5300. E/O/E.

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Database Consultant. Performs consulting duties in information systems area for firm's clients. Demonstrates data modeling skills including logical and physical design for RDBMS technology (Relational Data Base Management Systems), assists in planning, developing, testing and documenting of computer programs using programming skills in C language and RDBMS host languages; develops applications using open client architecture in Sybase; develops applications using GUI (Graphical User Interface) packages, including Visual Basic, Power Builder and SQL Windows; prepares written and oral reports, makes recommendations for management; assists in negotiating contracts as needed. 40 hrs./wk., $53,000/yr. Requires bachelor's degree or equivalent in education and experience, in Comp. Science or Business Computer Information Systems; and either 2 yrs. exp., or 2 yrs exp. in closely related information consulting position(s). Experience must include information system consulting in design and development of Client/Server based application software using PowerBuilder, Microsoft, C/C++, Pro C for DOS and Windows, Oracle, Sybase, and Windows 3.1 API. Requires ability to use VAX and IBM PC hardware platforms. Please apply with a resume in person to your local Kansas Job Service or send resume to: Department of Human Resources, KS797512, Attn: Don Bruner, 401 S.W. Topeka Blvd., Topeka, Kansas 66603-3182. Applicants must have proof of legal authority to work in the United States.

Staff Technical Support Engineer: Provide technical support in client-server RDBMS, SQL & 4GL. Research & resolve highly complex technical problems & mission-critical support requests. Contribute to design & development of diagnostic tools & techniques for use by technical support. Promote highest standards to customer needs. Resolve critical problems that cannot be resolved by Product Support Teams, train other Technical Support Personnel for product expertise with Open Client, Open Server, Replication Server & SQL Server. Must possess experience in the following: UNIX, NCR, DEC, Sun, or HP operating systems; SQL Server, Open Server and Open Client, TSQL, and C programming & UNIX programming tools. Required: B.S. or equiv foreign degree in CS, EE or Computer related degree & 5 yrs. experience in job offered or in Software development, tech. support, programming or software engineering in lieu of B.S. + 5 yrs exp will accept Master's degree & 3 yrs. experience. Sal: $77,464/yr. 40 hrs/wk. 8:30a.m. to 5:30p.m. Must have proof of legal authority to work permanently in the U.S. Place of employment: Chicago, IL. Send ad w/a resume to ILLINOIS DEPARTMENT OF EMPLOYMENT SECURITY, 401 South State Street-3 South, Chicago, Illinois 60605, Attention SHELLA LINDSEY, Reference # V-IL 12780-L. NO CALLS. AN EMPLOYER PAID AD. SEND 2 COPIES OF RESUME.

PROGRAMMER ANALYST (Ref 193195) (2 openings) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp., apply knowledge of comp. programming techniques & comp. language. Development & testing of modules using Sybase. Design, coding, sys. testing & development of Client-Server applications using C++, Object Oriented Concepts, Powerbuilder OOPS, Sybase & CASE tool. Reqs. Bach in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or or equiv or ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Systems Associate. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including each of the following: Development of Client-Server applications using Sybase, development & testing of modules & using C++, Object Oriented Concepts & Powerbuilder. $45,349.98/yr, 40 hrs/wk, 8:30a-5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202, & include Ref #. Employer Paid Ad.

Consultant to interact with client's management & user; analyze data processing requirements, design database management systems across multiple databases on multi-computer systems including NCR & AT&T UNIX-based platform & PC-DOS MS WINDOWS systems; utilize knowledge of theory & principle of CLIENT/SERVER RDBMS, VSAM, ISAM & technology of database design & optimization using E-R DESIGNER; implement & maintain various types of systems which share data across multiple databases using INFORMIX 4GL/SQL, SHELL Script, MS ACCESS & SCCS; generate system support document using various tools under MS WINDOWS environment including MS WORD, WORDPERFECT & WRITE. Reqs. Master's in Comp. Sci., Computer, Electrical or Electronic Engg., Systems Analysis or Comp. Info. Systems, 1 yr exp. in job offered or 1 yr related exp. each as Programmer Analyst. Related exp. must include analyzing data processing requirements & designing database management systems, also exp. using NCR-UNIX platform, CLIENT/SERVER RDBMS, VSAM, ISAM, E-R DESIGNER, INFORMIX 4GL/SQL, SHELL Script & SCCS. $44,000/yr. 40 hrs/wk 8:30a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref 02886 "Employer Paid Ad"

PROGRAMMER ANALYST (Ref 192086) (2 openings) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request of new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Design, development & implementation of sys. built on Client-Server Architecture developing logical & Physical data models, performing user acceptance cycles & giving user training & using IBM 3090, IBM 486, WINDOWS NT, C, COBOL, PVCS, WINDOWS 3.X, LAN-MANAGER, Microsoft SQL SERVER, MS-WINDOWS, Microsoft Visual C++, Microsoft Visual Basic & WINDOWS SDK. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Senior Analyst Programmer. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including design, development & implementation of systems built on Client-Server Architecture & using each of the following: Microsoft SQL SERVER, MS-WINDOWS, Microsoft Visual C++, Microsoft Visual Basic & WINDOWS SDK. $46,500/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 190895) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Analysis, coding, testing & s/w development using IBM 3090, MVS/ESA, IBM ES9000 SERIES, CICS, IBM PC Compatibles, MS-DOS, COBOL & DISAM, NORTON EDITOR, EZYTRIEVE, MS-DOS, FOXBASE, UNIX, C & MS-COBOL. Reqs. Bach in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 3 yrs. exp. in job offered or 3 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant, Software Programmer or Officer (Training & Software). Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including s/w development & using each of the following: MS-DOS, FOXBASE, UNIX, C & MS-COBOL. $45,000/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (Ref 194895) (2 openings) to plan, develop, test & document comp. programs; applying knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp. Analysis, design & develop s/w for taxation & revenue processing of Oil & Gas Industry. Responsibilities include writing program specifications, coding, testing, implementation, requirement analysis, logical modeling, defining automation boundaries & arriving at a physical model of the sys. using a relational database & on-line data communication sys., IBM 3090/ES 9000 h/w, VM/ESA, MVS/ESA, CICS/VS, VSAM, VS/COBOL, XDB & developing s/w in a PC environment. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Officer-Data Processing. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. which included writing program specifications, coding, testing, implementation & using each of the following IBM mainframe: VS/COBOL, CICS/VS, XDB & VSAM. $47,250/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (Ref 193095) (2 openings) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Analysis, design, co-ordination, development, planning, system testing, implementation & maintenance using IBM 3090, MVS/ESA, CICS, DB2, TSO, COBOL, ISPF, VS/COBOL II, VSAM, DMS, OMF, SPUFI, JCL, BEST FILE-AID, XPEDITOR, LOTUS NOTES, MICROFICHE, Visual Basic & SQL Server concepts. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including system design, development and using each of the following: IBM 3090, MVS/ESA, CICS, DB2, OMF, SPUFI, COBOL & TSO. $46,000/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (Ref 192395) (2 openings) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Sys. design, development, implementation using IBM AS/400, COBOL/400, QUERY/400, UNIX, PC, RLU, PDM, Client Access/400, VS COBOL II, VSAM, JCL, XDB & DB2. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant, Analyst/Programmer or Trainee Programmer. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including system design, development, implementation & using each of the following: IBM AS/400, COBOL/400, QUERY/400, UNIX & PC. $45,804/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (Ref. 192195) (2 openings) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Design, analysis, development & implementation of an integrated database system using IBM PC, IBM ES9000 mainframe, DOS/VSE, SQL/DS, FOCUS, REXX, Easytrieve, CICS, DB2 & COBOL. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 3 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Computer Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. including design, development & maintenance of various applications, database administration & using each of the following: IBM PC's, DOS/VSE, SQL/DS, DB2, COBOL, CICS, FOCUS & REXX. $48,000/yr, 40 hrs/wk, 8:30a-5p.

PROGRAMMER ANALYST (2 openings) (Ref 193895) to plan, develop, test & document comp. programs; apply knowledge of programming techniques & comp. systems, evaluate user request for new or modified programs, determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities; consult with user to identify current operating procedures & clarify program objectives, formulate plan outlining steps required to develop program using structured analysis & design, convert project specifications, using flowcharts & diagrams into sequence of detailed instructions & logical steps for coding into language processable by comp.; apply knowledge of comp. programming techniques & comp. language. Sys. analysis, design, development & maintenance of various applications, documentation & training using IBM ES9000, IBM PC, CICS, DB2, COBOL II, DG/SQL, BASIC, PASCAL, FOXPRO, DBASE IV, OMS, MVS/XA, MVS/ESA, MS/WINDOWS, MS/DOS, VS/ESA & VSAM. Reqs. Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv in ed. & exp. & 1 yr exp. in job offered or 1 yr related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Consultant or Software Training Professor. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occup. in lieu of the req'd ed. & exp. Must have some related exp. or training including use of COBOL, DB/SQL, BASIC, PASCAL, FOXPRO, DBASE IV & IBM PC. $47,354/yr, 40 hrs/wk, 8:30a-5p.

Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

Programmer/Analyst (Consultant, TX) Analysis, design & programming of client server marketing & administrative applications, under UNIX & MS-WINDOWS operating systems, using KORN SHELL programming, C language & SYBASE. Bachelor's in Computer Science, 2 yrs. exp. in job offered or 2 yrs. exp. in any combination of exp. as systems analyst, software engineer, computer laboratory supervisor or programmer/analyst performing aforementioned job duties. Experience in job offered or related occupation to include six months of graphical user interface programming exp. in POWER-BUILDER. $50,000.00/year, 8-5, M-F, 40 hrs./wk. Apply at the Texas Employment Commission, Dallas, Texas or send resume to The Texas Employment Commission, TEC Building, 1117 Trinity, Room 424T, Austin, Tx 78701, J.O. #TX7384823. Ad paid by an equal opportunity employer.

Programmer Analyst to analyze, develop, code & test computer applications in a VM/CMS IBM mainframe environment using FOCUS & Dialogue Manager; provide support for existing FOCUS applications in MVS/ESA environment using TSO & ISPF; provide technical support in custom configuring client PC hardware & software applications. Reqs. Bach. in Comp. Sci., & 2 yrs exp in job offered or 2 yrs related exp. such as Programmer Assistant or Computer Programmer. Related exp must include using FOCUS & Dialogue manager in VM/CMS environment & using ISPF in MVS/ESA environment. Must also have some exp installing & troubleshooting PC hardware & software. $36,000/yr. 40 hrs/wk 8:30a-5:30p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #02798 "Employer Paid Ad"

PROGRAMMER/ANALYST - Design, development and implementation of information system for automobile applications. Utilize C++ on UNIX operating systems, ORACLE, UNIFY Code base, LEX, YACC, Imake, SCCS, Pro-C, SQL Plus, Cursors, Make, dbx and tellix. Utilize X-windows for graphic user interface requirements. Master's degree in Mathematics or Computer Science required. Must have 4 years experience as programmer/analyst including 1 year of experience with Oracle, UNIFY Code base, LEX, YACC, IMAKE, SCCS, Pro-C, SQL Plus, Cursors, make dbx, tellix and in design/development or manufacturing environment. This experience is included in two year experiential requirement. 40 hrs./wk. 8-5, M-F. $46,000. Employer paid ad. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #177595

Database Analyst: Develops, designs, modifies, and implements data import and report generation system using an Oracle relational database in a client/server environment written in Visual Basic including use of SQL. Develops graphical user interfaces using PowerBuilder as a front-end development tool to create data access for individual users based upon their specific needs. Implements and modifies import specifications, report generation, and redesigns screens, forms, and reports as required by individual end users. Insures network access and data transfer within each networks and insures integrity of data being transmitted. Requires Master's degree in Computer Science or Management Information Systems. Also requires six months experience in the job to be performed. Education to include completion of one course in each of the following: Expert Systems, Database Management Systems, and Software Engineering Management. Education to include completion of one project in which the individual used PowerBuilder as a front-end graphic user interface in an Oracle database to create data access for individual users based upon their specific needs. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week to $45,000.00 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Edward L. Bounds, Senior Staffing Manager, DHS & Associates, Inc., 10255 West Higgins Road, #600, Rosemont, Illinois 60018.

PROGRAMMER ANALYST (Ref 191998) - to plan, develop, test & document comp programs, applying knowledge of programming techniques & comp. systems, evaluate user requests for new or modified programs to determine feasibility, cost & time required, compatibility with current sys. & comp. capabilities, consult with users to identify current operating procedures & clarify program objectives, s/w development in C/C++ for high end NURBS based 3D comp. graphic applications, application engineering work for developing CAD geometry to interface with various front end systems, & design, develop & test faster algorithms. Reqs Bach. in Comp. Sci., Systems Analysis, Computer Information Systems, Computer and Systems Engineering, Electrical Engineering, Electronic Engineering or its foreign ed. equiv. & 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Systems Analyst, Software Engineer, Research Assistant or Consultant. 1 yr related exp. including s/w development of user interface for creating NURBS surfaces, feature based modeling, and using C & UNIX & 1 yr related exp. including use of CATIA & Boolean Operations algorithms. Exp. may be concurrent. $46,000/yr., 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave, Rm 415, Detroit, MI 48202 & include Ref #. Employer Paid Ad.

Sr Software Engineer. 40hrs/wk, 8-5, $52,800/yr. Resolve software troubles written against telecommunication switching systems to the field. Plan, coordinate, & direct the effort of team members & provide guidance & instruction to other technical personnel. Design reviews concerning system & software functionality of telecommunication switching systems. Design quality assurance testing on ATM & Network Management Systems. Technology includes SS7, ASSEMBLY, PL/1, UNIX, CCITT, ANSI, & C. Min reqs: BS in Computer Science, Electrical Engineering or Math. & yrs in carrying out those duties set forth in the job offered or 5 yrs in design & development of telecommunication switching software (to include therein: 1 yr in SS7 with ASSEMBLY & PL/1 on UNIX, 2 yrs in maintenance of telecommunication switching & call processing software including SS7 ISUP & in using CCITT & ANSI to design software in SS7, & 1 yr in testing/maintaining ATM & Network Management Systems in C). Willingness to travel up to 5% of time nationwide. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. J.O. #TX7504257. Ad Paid by an Equal Opportunity Employer

SYSTEMS ANALYST required. Design & development of interactive forecasting & Decision Support systems on DOS & Windows platforms using expertise in Financial Accounting systems, Point of Sale & Order Entry software packages, statistical analysis & Information Strategy Planning. Use structured systems design/analysis techniques to develop User Interfaces on client/server networks. Bachelor's degree or its equivalent required in Computer Intensive Curriculum, plus 2 years experience in the job duties described above. Must have proof of legal authority to work in the U.S. Salary - $34,000/year for a 40 hour work week. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701. J.O. Number TX-7518647. Ad paid by an Equal Opportunity Employer.

Systems Analyst Reviews, analyzes, and determines appropriate computer systems based on specific needs of various clients. Evaluates current computer systems based on observation, systems testing, and examination of systems performance. Performs data analysis and assesses current system deficiencies and recommends various upgrading options and optional system. Develops computer systems including basic forms designs, manual preparation, program specifications and detailed systems documentation including designs and implementation of networks and creates applications. Identifies and resolves new system operating problems in order to continuously improve business operations and corporate strategies. Requires B.S. degree in Computer Science. Also requires six months experience in the job to be performed or six months experience as a Technical Support Specialist (Programmer Analyst). Experience in related field, entire experience must include performance of technical support of computer systems based upon specific needs of various clients using Visual Basic and C including implementation of relational database systems as well as creation of graphic user interface. Hours: 8:00 a.m. - 5:00 p.m. 40 hours per week to $34,500 per year salary. Please send resumes with social security number to Indiana Department of Workforce Development, 10 N. Senate Ave., Indianapolis, IN 46204-2277, Attention: Gene R. Replogle. I.D. #0371600.

Database Analyst: Determines software requirements for individual applications which are installed as an integral part of larger software modules used to provide manufacturing software and manufacturing simulations solutions to manufacturing processes worldwide. Designs and develops simulation packages and Graphic User Interfaces capable of transferring and storing massive amounts of data and insures integrity of data acquisition and transmissions. Uses C++ and Object-Oriented programming to establish data parameters for various software products. Performs Object-Oriented Analysis for use in complex applications which average 500,000 lines of codes. Uses Object-Oriented Analysis to be implemented as solutions in manufacturing engineering. Requires Master's degree in Computer Science, Math, or Physics. Education to include completion of one year research or M.S. thesis in which the individual performed data acquisition controls and wrote complex data applications consisting of 500,000 lines of code. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at $40,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to Hussein Arnouk, VP Research & Development, Tangible Vision, Inc., 1933 Loomis Avenue, Downers Grove, Illinois 60516.

Programmer Analyst (Engineering & Scientific). 40hrs/wk, 8-5, $46,000/yr. Engineering & scientific application model design at various client sites throughout the U.S. to interface with relational databases using the following computer tools (as they vary from client to client): SQL, 4GL, UNIX, C, & Mumps. 90% of work is performed in a travel context with client site assignments ranging from approximately 2 to 8 months. The employer's client server division is located in Dallas, Texas, to which the employee will be constantly reporting. Min reqs: MS in Computer Science. 2 yrs in carrying out those duties set forth in the job offered or 2 yrs in relational database using SQL, 4GL, UNIX, C, & Mumps. Willingness to travel approximately 90% of the time. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778. J.O #TX7518641 Ad Paid by an Equal Opportunity Employer

Software Engineer III needed to: provide technical expertise for integrated systems applications throughout the development life cycle. Working with ADABAS, Natural, CICS technology & various UNIX systems administration functions to identify, analyze, develop, test, debug, & implement customer's complex technical and business solutions. Provide guidance to less experienced Software Engineers. 40 hr/wk, 8:00 a.m. to 5:00 p.m., on call 24 hr. w/pgr. Salary $50,300/yr. Must have BS degree in Computer related field + 3 years experience in the job offered, or in lieu of degree + 3 yrs will accept 5 years experience in developing information processing solutions working with ADABAS, Natural, CICS technology & various UNIX systems administration functions. Apply at Texas Employment Commission, Dallas, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778. JO# TX7504816. Ad paid by an Equal Opportunity Employer

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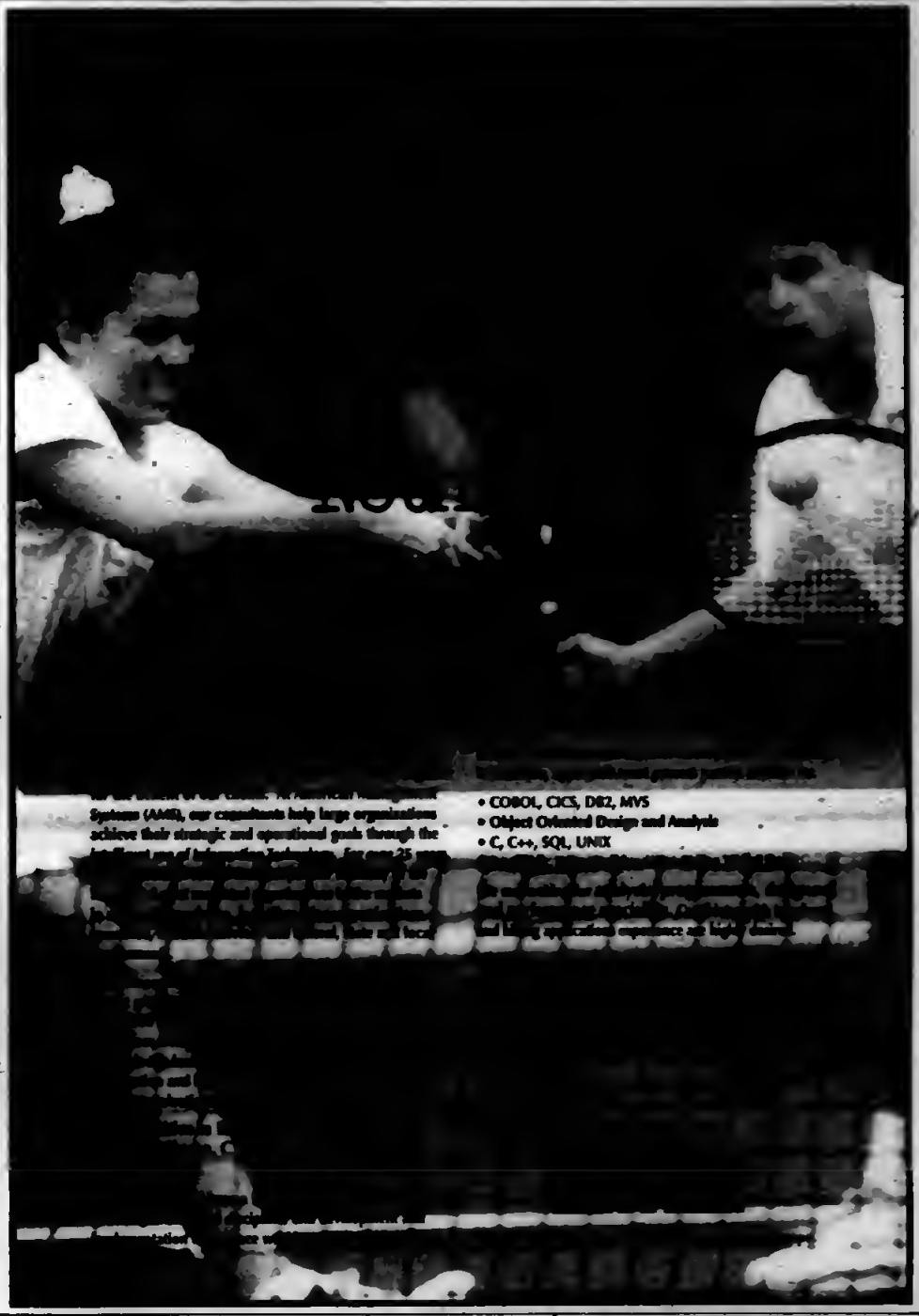
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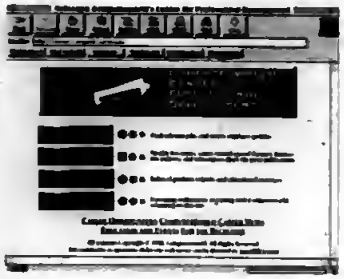

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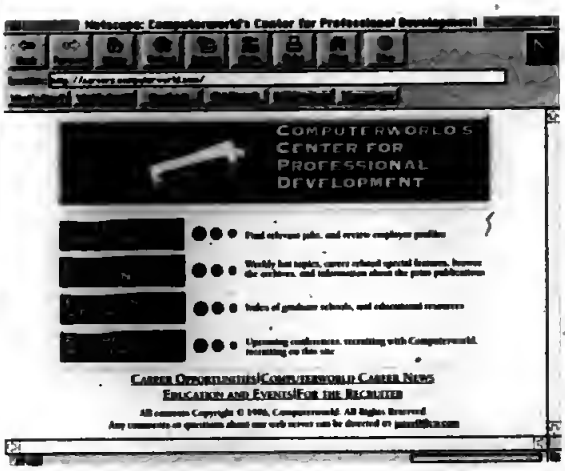

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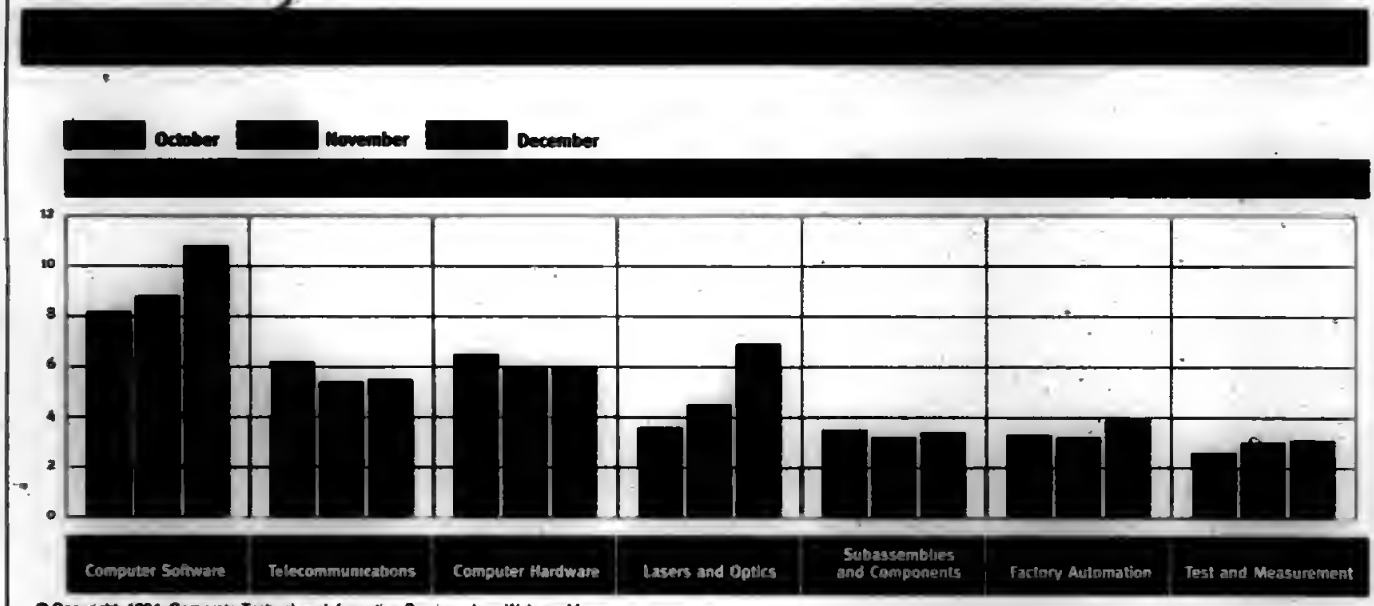

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Marketplace

PDAs

Promises, promises. The PDA market has been full of them. Vendors make promises, while users wait.

By Amy Malloy

PDAs have come a long way, but they still have a ways to go. Analysts compare user acceptance of PDAs with that of early PCs, which took years to become part of the office infrastructure.

"It was six years into the PC industry before everyone had to have one," says Gerry Purdy, editor of "Mobile Letter," a newsletter in Cupertino, Calif. In those terms, the personal digital assistant (PDA) is halfway there. PDAs came on the scene in late 1992. If the PDA follows the PC's six-year schedule, it may be 1998 or 1999 before it is a "must have."

But this market promises big rewards for vendors that stick it out and listen to users.

"I think the market will begin to improve in '96 and will be a hot market in '97, because a lot of things will have happened at that point, including the fact that we will have some very good communication links back to the desktop," predicts Andrew Seybold, editor in chief of "Outlook on Communications and Computing," a newsletter in Boulder Creek, Calif.

Misguided marketing strategies are partly to blame for the PDA's slow start. "Vendors aimed PDAs at the wrong market with the wrong strategy. They aimed them at the consumer, and they should have aimed them at the existing computer user," Seybold says.

However, the PDA is not without blame. Analysts and users have consistently complained about its technology. They demand improvements in communications, operating system connectivity to the desktop and add-on peripherals.

Users also demand handwriting recognition and a keyboard. Experts say vendors must make both available whether all users want them or not.

For some, handwriting recognition is what makes the device useful; others prefer the reliability and familiarity of a keyboard.

For those who believe that the ability to quickly jot down a message increases the efficiency of PDAs, Palm Computing, Inc. in Los Altos, Calif., offers Graffiti. This add-on peripheral speeds up the handwriting-recognition process. But not all peripherals are as effective.

The ideal PDA would have all kinds of features. But until that time, users need a broader range of peripherals. For example, Osagie Imasogie, associate general counsel at The Dupont-Merck Co. in Wilmington, Del., says he found a terminal emulator for his Psion, Inc. PDA, but it never worked.

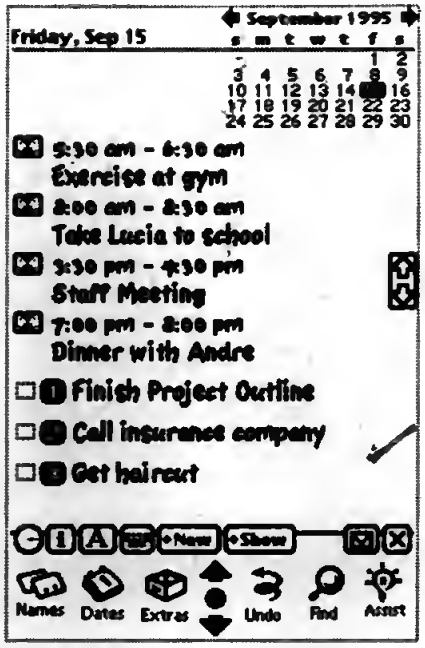
Users, however, praise the PDA for what it provides. "I am able to say this is what a spreadsheet looks like and print it out right there, as opposed to somebody running out of the office or doing it after the meeting," Imasogie says about his Series 3a Palmtop from Psion.

Bruce Gordon, project director at a major entertainment company, witnessed firsthand Apple Computer, Inc.'s improvements with the latest versions of Newton. "[Apple] listened to everything that was a problem with the first one and went in and fixed it, and it is astonishing how effective it is now that it really does work. It does what Apple said it was going to do two years ago," he says.

But this doesn't mean Newton is perfect.

Many users and analysts wish it displayed better communications. "Once the Newton has really dependable and easy-to-work cellular modem capability, it will be indispensable to anybody," Gordon says.

Bob Gray, a partner at Fulbright & Jaworski, a law firm in Houston, claims Motorola, Inc.'s Marco Wireless Communicator meets his communications needs. "A lot of times I will be in long meetings, and I can receive E-mail very discreetly," Gray says. But he wants broader coverage because problems occur when he tries to read electronic mail outside a Marco network service area.



Managing a daily schedule is still a core duty for PDAs

Hewlett-Packard Co. in Palo Alto, Calif., which sells the 100LX, 200LX and OmniGo, appears to be the market leader. With 600,000 units sold, HP stands out in the PDA market, according to Seybold. Apple in Cupertino, Calif., and Psion in Concord, Mass., are other top vendors.

Future PDAs will do more than fulfill past promises, analysts say. They will expand into new areas. Smart telephones, or super phones, will integrate two-way paging with cellular phones that provide access to the Internet and corporate databases. "When I say PDA, I include products such as smart phones, because basically they are going to be blurred over a period of time," Purdy says. ■

Malloy is *Computerworld*'s assistant researcher.

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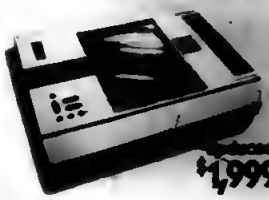

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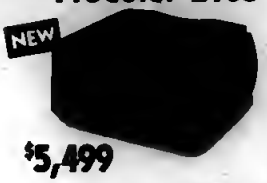

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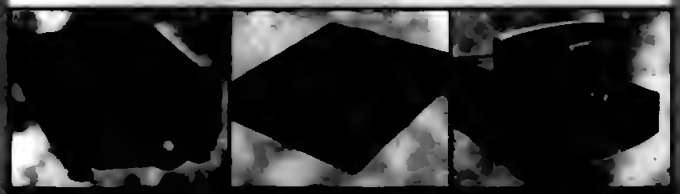

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Security Dynamics Tech.	6.5	Dell Computer Corp.	-13.6
Compuware Corp. (L)	6.2	Softkey International Inc. (L)	-12.7
Newbridge Networks Corp.	6.0	Network Computing Devices	-11.8
Pinnacle Micro Inc.	5.5	Dataware Technologies Inc.	-11.6
Tandem Computers Inc. (L)	5.3	Sybase Inc.	-9.5
Micrografx Inc.	4.5	Microcom Inc.	-8.2

Dollar

Gainers		Losers	
Security Dynamics Tech.	3.00	Dell Computer Corp.	-4.50
Newbridge Networks Corp.	2.62	NetManage Inc.	-4.19
Systemsoft Corp.	1.50	Netscape Comm. Corp.	-3.50
Network General	1.25	Sybase Inc.	-3.00
SynOptics	1.19	Softkey International Inc. (L)	-2.63
Xilinx	1.19	Cabletron Systems	-2.38
Standard Microsystems Corp.	1.13	Micron Technology	-2.38
America On-Line	1.13	Cascade Communications	2.00

[redacted]

Wall Street's technology storm

It was anything but quiet last week on woebegone Wall Street. Trading halted after three hours Monday because of a blizzard; the Dow Jones had jitters over the Capitol Hill budget battles; and the technology sector practically fell off the table, with major downturns in the software and semiconductor sectors.

Several software stocks fell sharply recently following a combination of poor quarterly results and the effects of slower-than-anticipated Windows 95 sales. **Adobe Systems, Inc. (ADBE)** tumbled more than $16, and **FTP Software, Inc. (FTPS)** lost more than 50% of its value in one day's trading (see chart).

Roxane Googin, an analyst at Gruntal & Co. in Beverly Hills, Calif., cited two reasons for slow desktop applications sales: "a gross estimation of application product sell-through for Windows 95 and confusion over what the Internet means. It isn't clear to people what they need for the Internet, so they are hesitant to buy much."

Googin also pointed out that other desktop application companies, including **Corel Corp. (COSFF)** and **Symantec Corp. (SYMC)**, have hit 52-week lows for the same reasons.

On the semiconductor side, stocks plunged early last week after analysts at Josephthal, Lyon & Ross, Inc. and Soundview Financial Group downgraded several chip companies, including **National Semiconductor Corp. (NSM)** and **Applied Materials, Inc. (AMAT)**.

Michael Geran, an analyst at a division of Donaldson Lufkin & Jenrette Securities Corp. in Jersey City, N.J., said the souring on semiconductor companies is driven by "institutional managers who have gone from believing in growth and high prices [for this sector] to thinking there will be a rerun of the past, when an oversupply of capacity came on as the demand for it fell." If this type of disequilibrium does occur, Geran said, it won't happen until much later this year. *— Stewart Deck*

Technology whiteout

The applications software and semiconductor sectors have been hit especially hard in Wall Street's storm of technology sell-offs

Company	Closing price Jan. 2	Closing price Jan. 11
Adobe	64 1/8	39 1/4
FTP Software	29	12 3/16
Corel	13 1/8	10 3/4
Symantec	22 5/8	11 1/8
National Semiconductor	22 3/4	16 3/4
Applied Materials	41 5/8	36

Exch	52 Week Range		Company	Jan. 12 Close	Wk Net Change	Wk Pct Change
Communications and Network Systems						
COMS	53.61	22.25	3COM Corp	50.56	3.19	2.6
AIT	80.00	00.25	Ameritech Corp (H)	56.13	-0.25	-0.4
APTS	15.00	6.00	Aperton Tech (L)	6.25	0.00	0.0
T	00.00	47.63	AT&T	65.50	0.25	0.4
ASND	41.11	5.61	Ascend Communications (L)	37.75	0.75	2.0
BNYN	19.38	4.00	Banyan Systems Inc	50.13	-0.38	3.6
BNET	50.00	18.00	Bay Networks Inc	39.25	-0.25	-0.8
BEL	70.50	48.61	Bell Atlantic Corp (H)	00.63	0.13	-0.2
BLS	45.00	20.00	BellSouth Corp (H)	41.75	0.38	-0.0
BBN	00.75	16.75	Bolt Beranek and Newman	34.75	1.00	2.8
BRKT	37.00	50.50	Brooktrout Technology	29.00	0.50	1.6
CS	87.75	37.38	Cabletron Systems	72.38	2.38	3.2
CSCC	92.50	50.41	Cascade Communications	70.75	2.00	2.7
CGRM	25.13	12.25	Centigram Communications	16.25	1.00	-5.8
CSCO	00.18	32.38	Cisco Systems Inc	10.00	-0.75	1.1
CLIR	11.38	6.00	Compression Labs Inc.	8.63	-0.31	-4.5
CNNT	12.25	4.00	Computer Network Tech	4.94	0.00	1.1
XCOM	14.50	9.00	CrossComm	10.63	0.25	2.4
DIGI	64.00	26.38	DSC Communications (L)	20.19	1.50	-5.1
FORE	67.75	25.50	FORE Systems Inc	53.50	-0.75	1.6
GDC	35.00	9.25	General Datacomm Inds	13.25	-0.38	2.0
GSX	42.50	28.00	General Signal Networks	32.75	0.25	0.0
GTE	45.41	30.00	GTE Corp (H)	44.38	-0.25	-0.6
MCIC	27.50	17.38	MCI Communications Corp	26.94	0.31	1.2
MICM	12.50	5.50	MICOM Communications Corp	7.29	-0.50	-6.3
MNPI	38.00	9.00	Microcom Inc	20.00	1.00	-8.2
NETM	34.00	10.38	NetManage Inc.	10.38	-4.19	20.8
NTRX	30.13	3.63	Netrix Corp	4.38	0.00	0.0
NCDI	12.00	4.00	Network Computing Devices	5.63	-0.75	11.8
NWK	42.00	19.75	Network Equipment Tech	24.75	-0.75	-2.9
NETG	00.50	22.25	Network General	33.25	1.25	3.9
NWTH	42.19	7.38	NetWorth Inc	47.13	0.00	0.0
NN	46.38	25.00	Newbridge Networks Corp	46.18	2.62	6.0
NT	44.25	31.50	Northern Telecom Ltd	47.13	-0.50	-1.2
NOVL	21.25	13.75	Novell Inc	14.25	0.00	0.0
NYN	54.00	35.00	Nynex Corp	50.25	-0.50	-1.0
OCTL	47.63	18.00	Octel Communications Corp	28.25	-0.75	-3.0
ODSI	43.25	17.75	Optical Data Systems Inc.	21.44	-0.31	1.4
PCTL	43.00	11.50	PictureTel Corp	36.13	-0.75	2.0
PTON	10.75	5.50	Proteon Inc	6.06	-0.06	-1.0
RACO	7.00	1.13	Racotek Inc	4.63	-0.38	-7.5
RETX	5.50	1.83	Retix	2.13	0.00	0.0
SFA	24.00	13.38	Scientific Atlanta Inc	14.00	0.25	1.8
SHVA	77.50	27.00	Shiva Corp	63.00	-0.25	-0.4
SBC	00.25	39.63	Southwestern Bell Corp (H)	55.38	-0.50	-0.9
FON	41.29	26.38	Sprint Corp (H)	38.38	-0.63	-1.6
SMSC	11.63	12.50	Standard Microsystems Corp	17.75	1.13	6.8
STRM	82.00	32.00	Stratacom Inc	64.50	0.00	0.0
TBIT	8.63	2.38	Telebit Corp	4.29	-0.13	-2.8
USRX	130.50	21.63	US Robotics	76.09	-0.81	-1.0
USW	00.38	28.38	US West Inc	34.50	-0.17	-0.4
XIRC	19.00	8.88	Xircom	10.50	-0.38	3.4
XLGX	78.00	33.38	Xylogics Inc	98.75	0.00	0.0
PCs and Workstations						
AALR	9.63	4.13	Advanced Logic Research	6.75	-0.13	-1.8
AAPL	50.13	33.38	Apple Computer Inc (L)	34.00	1.00	-2.9
ASTA	19.13	7.50	AST Research Inc	8.75	0.00	0.7
CPQ	56.75	31.12	Compaq Computer Corp	00.38	-0.50	-1.1
DELL	49.38	19.25	Dell Computer Corp	29.00	-4.50	-13.6
GATE	37.50	16.00	Gateway 2000 Inc.	21.06	1.06	-4.8
HWP	06.61	50.13	Hewlett Packard Co.	50.63	-0.00	-1.1
MUEI	29.00	8.38	Micron International Inc	30.38	-0.38	-3.5
NIPNY	75.13	45.13	NEC America	00.25	1.25	-2.0
SGI	45.63	21.33	Silicon Graphics	24.38	0.00	0.0
SUNW	51.50	15.00	Sun Microsystems Inc	00.25	1.00	-4.5
Large Systems						
AMH	13.63	7.69	Amdahl Corp (L)	7.00	-0.13	1.6
CNX	0.13	1.63	Convex Computer	4.75	0.00	0.0
CYR	29.25	34.63	Cray Research Inc.	26.38	0.75	1.6
DGN	14.25	6.75	Data General Corp.	12.25	-0.75	-2.0
DEC	65.00	32.12	Digital Equipment Corp	58.50	0.38	0.8
IBM	134.63	70.25	IBM	00.50	-0.75	-0.9
MDCO	12.25	7.00	Meridian Data Inc	9.25	-0.50	-4.0
NCTI	7.25	4.25	NetFrame	4.75	0.00	0.0
SQNT	25.38	13.25	Sequent Computer Sys (L)	12.25	-0.50	3.6
SEQS	10.00	3.50	Sequoia Systems Inc	5.00	0.00	0.0
SRA	38.00	23.00	Stratus Computer Inc	31.00	0.25	0.8
TDM	19.25	9.25	Tandem Computers Inc. (L)	30.38	0.50	5.1
TRCD	6.25	2.50	TriCord Systems	2.75	-0.06	-2.2
UIS	13.61	5.50	Unisys Corp	6.00	0.25	3.8
Software						
ADBE	74.25	29.50	Adobe Systems Inc	38.88	-0.38	1.6
AMSWA	0.75	2.75	American Software Inc	5.61	0.00	1.2
APLX	29.00	6.75	Applix Inc. (H)	24.75	1.00	-3.9
ARSW	48.50	29.88	Arbor Software (L)	37.00	-1.25	-3.8
ACAD	53.00	29.00	Autodesk Inc (L)	29.69	-1.50	-5.0
BACH	10.75	3.63	Bachman Info. Systems	9.38	0.13	1.6
BGSS	47.00	23.75	BGS Systems Inc.	35.00	0.00	0.0
BMCS	51.50	27.00	BMC Software Inc	38.50	-0.75	-1.9
BOOL	28.38	17.13	Boole and Babbage	21.50	0.25	1.2
BORL	29.63	6.50	Borland Int'l Inc.	17.50	-0.75	-5.9
CESH	3.94	1.38	CE Software	2.75	0.00	0.0
CYE	27.00	12.38	Cheyenne Software Inc	23.75	0.50	2.2
COGNF	45.63	16.00	Cognos Inc	39.50	1.38	-3.4
CA	50.50	31.13	Computer Associates	54.88	-1.50	-2.7
CVN	35.50	6.13	Computervision Corp	12.38	-0.13	-1.0
CPWR	41.00	15.50	Compuware Corp (L)	12.50	1.00	8.1
CSRE	27.25	9.13	Comshare Inc	22.75	-0.50	2.2
COSFF	19.50	10.00	Corel Corp. (L)	10.63	-0.13	-1.2
DWTI	16.25	7.25	Dataware Technologies Inc	7.75	-1.00	-11.6
DSLGF	32.25	16.13	Discreet Logic Inc	19.63	0.25	1.3
FILE	51.00	25.50	FileNet Corp	47.75	-0.50	1.0
DDDDF	8.25	3.50	4th Dimension	4.00	0.00	0.0
FTPS	00.63	11.13	FTP Software Inc (L)	11.50	-0.50	-4.2
GSOF	20.00	7.50	Group 1 Software (L)	7.50	0.00	0.0
GPTA	13.50	4.88	Gupta	9.50	-0.38	-0.6
HOGN	13.00	4.63	Hogan Systems Inc.	12.31	0.19	1.5
HYSW	38.38	15.03	Hyperion Software Corp	22.25	0.00	0.0
IRIC	39.63	10.00	Information Resources	13.50	-0.50	-3.0
IFMX	34.38	14.00	Informix Corp	29.61	-0.63	-2.1
INGR	10.50	8.63	Intergraph Corp	17.13	0.00	0.0
LEAF	17.63	1.25	Interleaf Inc.	7.38	-0.10	-2.3
ISLI	26.25	8.75	Intersolv Inc.	10.61	0.38	3.2
INTU	89.25	29.63	Intuit Inc.	62.00	0.00	0.0
MGICF	11.50	1.63	Magic Software Enterprises	0.56	-0.19	-2.1
MANU	10.50	0.25	Manugistics Group Inc	11.63	-0.13	-1.1
MAPS	10.00	10.00	MapInfo Corp (L)	13.25	0.38	3.0
MATH	2.38	2.00	MathSoft	5.88	-0.25	-4.1
MCAF	52.88	10.13	McAfee Associates	37.50	-0.25	0.7
MENT	22.88	12.38	Mentor Graphics	15.75	-0.06	-0.4
MIFGY	13.75	8.25	Micro Focus (L)	9.63	0.00	0.0
MGXI	16.29	5.25	Micrografx Inc	14.38	0.83	4.5
MSFT	109.25	58.25	Microsoft Corp	85.03	-1.00	-1.2
ORCL	48.75	27.75	Oracle Corp	42.50	0.63	1.5
PMTC	77.56	35.75	Parametric Technology	57.00	-0.25	0.4
PARQ	27.25	6.63	ParcPlace Systems Inc	9.69	-0.31	3.1
PSFT	47.00	13.00	PeopleSoft	36.25	1.25	3.3
PTEC	16.13	6.18	Phoenix Technologies	13.50	-0.25	-1.8
PSQL	16.00	3.63	Platinum Software (L)	3.63	-1.06	22.7
PLAT	26.00	13.50	Platinum Technology	15.63	-0.38	-2.3
PRGS	50.00	19.63	Progress Software Corp	27.75	0.38	1.4
RNBO	29.25	14.00	Rainbow Technologies Inc.	19.63	-0.75	1.3
ROSS	7.75	2.19	Ross Systems	3.00	-0.13	-4.0
SDTI	58.25	0.00	Security Dynamics Tech.	49.12	3.00	6.5
SKEY	33.25	10.13	Softkey International Inc (L)	18.13	-2.63	-12.7
SPCO	5.63	2.50	Software Publishing Corp (L)	2.69	-0.06	-2.3
SOTA	12.50	6.63	State of the Art	9.50	-0.13	-1.3
SSW	62.38	32.00	Sterling Software Inc.	61.50	-0.75	-1.4
SDRC	30.38	5.13	Struct. Dynamics Research	24.13	-1.13	6.3
SYBS	55.00	19.00	Sybase Inc.	28.50	-3.00	-9.5
SYMC	33.25	10.13	Symantec Corp. (L)	11.13	-0.13	1.1
SNPS	29.50	22.23	SynOpsys	34.00	1.19	3.6
SSAX	30.63	10.83	System Software Assoc	20.00	-1.25	-8.0
SYST	18.13	7.00	Systemsoft Corp	50.88	1.50	16.0
TRUV	10.13	2.88	Truevision Corp	5.00	0.00	0.0
VIEW	13.13	2.88	ViewLogic Systems	10.00	0.13	1.2
VMRK	25.50	5.75	VMark Software Inc	9.00	0.06	0.8
WALK	9.75	4.63	Walker Interactive Systems	7.00	-0.38	-5.1
WALL	35.50	16.50	Wall Data Inc	15.50	-0.13	-0.8
WANG	19.50	11.13	Wang Laboratories Inc.	16.13	0.13	0.8
Internet						
AMER	46.25	32.38	America On Line	36.38	1.13	3.2
NETC	91.50	19.00	Netcom On Line	34.25	1.00	-2.8
NSCP	174.00	45.25	Netscape Comm. Corp	237.23	-3.50	-2.1
QDEK	29.50	7.38	Quarterdeck Corp	29.29	-1.25	2.9
SPYG	61.00	13.25	Spyglass Inc	67.73	0.00	0.0
UUNT	98.25	25.75	UUNet Tech.	68.25	2.00	-4.0
Semiconductors						
AMD	30.25	16.13	Advanced Micro Devices	12.75	-0.13	-0.7
ADI	38.38	13.50	Analog Devices Inc.	30.88	-0.25	-1.2
CHPS	15.00	8.25	Chips and Technologies	8.75	-0.13	1.6
CRUS	81.13	12.13	Cirrus Logic	10.63	-0.75	3.9
CY	27.25	50.00	Cypress Semiconductor Corp (L)	11.50	-0.25	2.2
INTC	78.38	37.88	Intel Corp	56.29	-0.50	-0.9
LSI	67.50	19.75	LSI Logic Corp.	26.00	1.00	3.7
LSCC	43.00	18.00	Lattice Semiconductor	27.75	-1.00	-3.9
MCRL	32.38	12.50	Micrel Semiconductor Inc	15.75	-0.23	-1.6
MU	94.25	21.00	Micron Technology	33.50	-2.38	-6.6
MOT	82.50	44.25	Motorola Inc. (L)	49.00	1.13	-2.2
NSM	33.63	16.38	National Semiconductor (L)	16.50	-0.75	-1.5
SERA	28.25	8.13	Sierra Semiconductor	12.12	-0.25	1.9
TXN	83.25	32.75	Texas Instruments	45.75	-2.00	-4.2
VLSI	30.13	12.25	VLSI Technology	15.50	-0.06	-0.4
WWTR	0.00	2.12	Weitek	2.23	0.00	0.0
WDC	22.13	13.13	Western Digital Corp.	17.13	0.00	0.0
XLNX	35.38	19.00	Xilinx	21.00	1.19	3.7
ZLG	56.13	28.50	Zilog Inc.	32.00	-0.25	0.0
Peripherals and Subsystems						
APCC	25.00	0.13	American Power Conversion	9.25	0.00	0.0
ADPT	48.38	23.13	Adaptec Inc.	38.00	1.38	3.4
BTEC	22.75	14.75	Banctec Inc.	18.00	0.00	0.0
CBEX	13.13	3.50	Cambex Corp	7.13	0.13	1.8
CGN	7.25	2.13	Cognitronics Corp	6.19	0.25	4.2
CNR	70.00	0.75	Conner Peripherals	21.50	-0.50	-2.3
CREAF	14.13	3.00	Creative Technologies Inc.	8.88	-0.25	-2.7
RACE	13.13	1.63	Data Race Inc	8.38	-0.38	7.9
DTM	0.38	4.50	Dataram Corp	6.13	0.00	0.0
EMC	27.38	13.00	EMC Corp	17.25	-0.25	-1.4
EMLX	38.50	0.13	Emulex Corp. (L)	9.63	-0.13	-1.2
ESCC	35.25	11.75	Evans and Sutherland	20.50	0.75	3.8
EXBT	31.63	10.00	Exabyte	15.63	-0.38	-2.1
INSLF	4.25	1.75	Intelligent Info. Systems (L)	1.88	0.00	3.4
IOMG	53.25	8.00	Iomega Corp	43.73	0.83	1.4
IPLSA	7.88	2.00	IPL Systems Inc.	2.73	-0.13	-4.2
KMAG	37.50	11.13	Komag Inc (H)	38.50	0.38	1.6
MXTR	7.25	3.88	Maxtor Corp	6.63	0.00	0.0
MLIS	11.50	2.75	Micropolis Corp. (L)	3.62	-0.00	-1.7
MTSI	45.75	13.50	Micro Touch Systems Inc	12.25	-0.50	-3.8
PEAK	34.75	14.25	Peak Technology Group	30.00	0.75	2.6
PNCL	19.75	5.88	Pinnacle Micro Inc.	14.50	0.75	5.5
PTNX	38.25	13.50	Printronix Inc	29.38	-1.13	-5.2
AQM	9.38	3.75	QMS Inc.	5.75	-0.25	-4.2
QNTM	28.50	13.25	Quantum Corp	17.63	-0.75	1.6
RDUS	33.00	1.88	Radius Inc.	2.31	0.06	2.8
SEG	54.25	23.63	Seagate Technology	49.25	-0.00	-1.2
STK	33.25	17.88	Storage Technology	22.25	-0.17	-0.5
TEK	61.00	31.38	Tektronix Inc.	44.00	0.00	2.0
XRX	144.63	99.75	Xerox Corp	130.63	-0.75	-0.6
Services						
AMSY	21.25	13.13	American Mgmt. Systems (L)	19.25	0.38	2.0
ANLY	33.00	19.75	Analysts Int'l.	38.50	-1.25	-4.2
AUD	61.25	39.25	Auto Data Processing	79.29	-0.88	-2.2
CATP	01.00	22.25	Cambridge Tech. Partners	47.75	0.50	1.1
CEN	47.50	26.63	Ceridian Corp	37.00	-1.50	-3.9
CDD	23.75	14.88	Comdisco Inc	21.29	-0.13	-0.6
CHRZ	26.75	6.38	Computer Horizons (L)	75.00	-0.75	-2.9
CSC	75.25	46.50	Computer Sciences	47.62	-1.38	2.0
TSK	24.00	8.25	Computer Task Group	19.50	0.63	3.3
CPU	44.38	15.25	CompUSA Inc	28.88	1.25	-4.3
CDAT	31.38	5.88	Control Data Systems Inc.	15.75	-0.13	-0.8
EGGS	16.25	5.75	Egghead Discount Software (L)	5.50	-0.25	-4.3
GME	54.75	30.88	General Motors E (EDS) (H)	53.63	-1.00	-1.9
IMAC	15.25	7.13	Imacon Corp.	14.00	0.00	0.0
INEL	14.63	5.25	Intelligent Electronics (L)	6.00	0.75	4.3
MSEL	0.29	3.88	Merisel	5.31	-0.31	-5.6
MICA	15.00	2.75	Microage Inc.	8.13	-0.25	-3.0
PAYX	51.25	25.88	Paychex (H)	80.88	-1.00	2.0
PMS	54.25	00.25	Policy Management Sys.	46.29	-0.38	-0.8
REY	30.63	22.88	Reynolds and Reynolds	32.50	0.00	0.0
SEIC	24.50	16.75	SEI Corp	22.50	0.00	0.0
SMED	57.62	53.00	Shared Medical Systems	00.63	-1.00	-2.0
SHKIF	13.13	4.75	SHL Systemhouse	12.63	0.00	0.0
SSPE	26.50	14.88	Software Spectrum Inc.	19.50	0.00	0.0
SNDT	32.50	17.75	Sungard Data Systems	27.75	-1.25	-4.3

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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ISDN rate hikes may hinder use

CONTINUED FROM COVER 1

al Bell operating companies. Unlike a regular telephone line, an ISDN line has two channels that can each transmit data at 64K bit/sec. It offers much more bandwidth than the fastest dial-up modems.

"US West is shooting themselves in the foot," said Walter Williams Jr., director of information systems for New Mexico's Secretary of State's Office.

He said the company's decision to raise rates will simply mean lost revenue that will find its way into the pockets of independent Internet access providers.

Under one pricing scenario, a Pac Bell customer who uses ISDN 60 hours a month would see his bill rise from $36.50 a month to $63.50 a month.

Pac Bell, which promised last spring to cut ISDN rates, now is reversing course to say that the majority of its ISDN users should expect to see an average 13% monthly increase in their bills. Users who don't buy the service for a two-year period will now pay a onetime $125 installation charge per line. It had been waived for those who bought the service for two years.

The current monthly charge — $25.93 per business line and $24.50 per home phone line — won't change.

Intel on board

Even Intel Corp., a company whose flagship desktop video system uses ISDN, rose to block the proposed US West rate hikes.

Internet profits

Dan Kegel, a senior programmer at Activision, Inc. in Los Angeles, said the proposed rate hike is a way for the RBOCs to cash in on the popularity of the Internet.

"People are livid," said Kegel, who has a popular ISDN home page on the Internet. He said he wouldn't oppose a smaller usage fee.

Users in US West's region don't like the RBOCs' plan as outlined in the petition rejected by Washington state.

"It's perverse," said Gregory J. Howe, president of Howe Electronic Data, Inc. in Lake Oswego, Ore., referring to the proposed US West rate increase. Being able to send data via ISDN would "save me a ton of money," he said.

US West plans to propose new rates again soon.

Ironically, Pac Bell, which had promised in March to deploy 1 million ISDN lines by 1998, admitted in its filing with California state regulators that it underestimated how heavily the service would be used. It also was off the mark on how widely users would want it deployed.

Pac Bell found that although the majority of customers use less than 20 hours each month, a minority of users are maximizing use on evenings and weekends. This has resulted in an overall average of 47 hours of night and weekend local usage per home ISDN customer per month — compared with the 20 hours that Pac Bell was expecting.

Now Pac Bell is the victim of its own grandiose ISDN plan, analysts said.

Pac Bell's home ISDN customers currently have unlimited local usage during night and weekend time slots.

Pac Bell also underestimated how far from its switching centers users would want ISDN. The service can be offered easily to users up to 15,000 feet — which is almost three miles — from the nearest ISDN-equipped switch.

"Our original study estimated that 12% of the customers would be located beyond 15,000 feet from the central office," Pac Bell said in its filing. Its current studies indicate that 24% of business ISDN and 30% of home ISDN customers are located farther than that from the nearest switch, however.

No more free weekends

Pac Bell proposes doubling the daytime ISDN usage rate and eliminating unlimited use at night and on weekends

Sample user*	Current pricing	Proposed pricing
Base charge	$24.50	$24.50
20 hours at the daytime rate	$12	$24
40 hours at the evening and weekend rate	No charge	$15
Total monthly cost	**$36.50**	**$63.50**

*Actual costs may vary

Source: *Computerworld* estimate from Pac Bell's rate filing information

Managers reconsider ISDN in wake of US West, Pac Bell moves

IS managers will have to reevaluate any plans they have to use ISDN service, in the face of rate hike requests from Pacific Bell and US West, industry analysts said last week.

The remaining five RBOCs are likely to have made the same miscalculation about ISDN use that Pacific Bell confessed to before California state regulators.

"My basic assessment is to expect the rest to raise ISDN rates, too," said Mike Finneran, president of dBrn Associates, Inc. in Hewlett Neck, N.Y. The firm specializes in ISDN education and consulting. "Pacific Bell is much further along in terms of dealings with ISDN than the others," Finneran said.

Prospective ISDN users elsewhere expressed strong concern that they also could face rate increases.

"We're in the process of evaluating ISDN for after-hours use by faculty and students, but if we began using the service and suddenly had to pass along rate increases to them, they'd be irate," said Barbara Mauskart, director of information services at Emory University's Rollins School of Public Health in Atlanta. "I'm afraid these rate increases will make users disenchanted with ISDN."

IS managers need to determine if and where ISDN is a cost-effective service for their applications, Finneran said. A price increase could make users think twice about giving up their slower, but less expensive, 28.8K bit/sec. modems. "Users will end up paying more to support telecommuters if they go with ISDN," Finneran predicted.

"But if remote workers are just calling in a few times a day for their E-mail and small file transfers, they can probably get by with 28.8K bit/sec. modems."

— Bob Wallace and Neal Weinberg

See our QuickPoll on the subject on our Web site at http://www.computerworld.com.

Apple loss will force fourth restructuring

CONTINUED FROM COVER 1

restructuring and significant layoffs.

Apple declined to quantify the expected loss for the quarter ended Dec. 29, but analysts estimated it at $68 million.

The official earnings report is due out after the close of the stock market on Wednesday. At that point, Apple also is expected to unveil the preliminary stages of its fourth restructuring in the past 12 months, according to Pam Miracle, an Apple spokeswoman. She declined to comment on speculation that Apple will cut its workforce.

However, industry watchers and sources both close to and inside Apple predict that the Cupertino, Calif., computer maker will cut between 2,000 and 4,000 workers from the ranks of its 17,000 employees worldwide.

Observers say the cuts are needed to bring declining margins more in line with the company's high operating costs. Apple is expected to report gross margins of 15% for its first quarter, compared with 28.7% for the same period in 1994.

Although the restructuring plans haven't been revealed, four recently appointed vice presidents resigned last week (see chart below).

One analyst said Apple got into this situation by desperately grabbing for more market share.

"Now every bad quarter not only looks bad in the short term, [but] it looks bad for the long term," said Bill Gurley, an analyst at CS First Boston in New York.

Apple President and CEO Michael Spindler is bearing the brunt of the criticism. Some financial analysts are calling for Spindler to step down or sell the firm.

But Kimball Brown, an analyst at Dataquest, Inc., said Spindler should stay on because Apple already has lost many top officials.

Apple officials said the company continues to back Spindler, who appears to be keeping a low profile.

Selling mood

"The pressure is really on Spindler now to sell Apple," said Jeff Matthews, a general partner at RAM Partners, an investment firm in Greenwich, Conn. "They need to find someone who wants an immediate distribution channel and a big chunk of the education market."

Meanwhile, loyal Macintosh users said it won't deter them from buying Macintoshes in the future.

"Apple has gone through restructurings before and will get out of this [one] successfully," said Joe Nagy, chief of the Facilities Engineering Group at the U.S. Mint in Denver. "I'm so confident that it will be worked out that if someone asked me in a week what kind of computer I would buy, I would without any reservation say a Mac."

"Apple is just remaking themselves in order to be more competitive," said John Papa, a partner at The Carson Group, a consultancy in New York with more than 100 Macintoshes.

Papa also offered up his prescription for what is ailing Apple.

"The first thing I would do is lower prices even further to get more machines out there and increase market share. I would also make sure that I was outsourcing manufacturing [to] meet increased demand for the lower-cost products," he said.

Candle pioneers remote system management

Charles Babcock

You may not have heard a lot about Candle Corp. recently because it is an aging mainframe software company trying to adjust to the modern world. But Candle claims it is pouring millions of dollars into a system management project that makes other such efforts pale.

System management remains a black art. We can monitor networks and identify nodes that have gone down, but actually managing the operating system of a remote server or desktop application all too often remains beyond our reach.

Candle in Santa Monica, Calif., was founded in 1977 and made a name for itself with the Omegamon performance monitor. Omegamon let system operators monitor IBM's MVS operating system performance in real time instead of analyzing dumps after trouble had materialized. Soon, there were Omegamons for the main subsystems of MVS, such as CICS, VTAM, DB2 and IMS. Today, there are 18,000 to 20,000 Omegamons at work in data centers.

But three years ago, Candle realized that a mainframe utility family wasn't enough on which to hang the hat of a $200 million firm. It wanted to move beyond MVS and monitor system performance across hardware platforms and operating systems.

Candle has made good on enough of this audacious project to warrant a heads-up.

It needed to move into object-oriented development so that its Omegamons could be converted into active agents that monitor operating system performance and application availability, and report to a remote command center.

Data center managers could expand geometrically the scope of what they can manage if they could get the information they need on a variety of remote systems in one format, with rule-based alerts and common chart displays. "Data centers need to leverage the small amount of expensive talent they have," said David Caddis, Candle's director of solutions management.

Candle last March announced Candle Command Center, a product line for system management of diverse platforms. It comprises an OS/2 or Windows NT workstation, which serves as the command console. The console receives feeds from a server system that runs on MVS or AIX and manages multiple MVS sites, or Unix machines that run IBM's AIX, Hewlett-Packard's HP-UX and Sun's SunOS.

Although the hub is an MVS server, Candle soon will release a version that can manage Unix machines from a Unix hub.

Candle will also release this year a Command Center that can pass the alert monitoring function from hub to hub of a worldwide network, so an international company can have its system management follow the sun, says Andy Mullins, assistant vice president at Candle.

Candle officials say they would like to add recovery mechanisms to such a system so that if the primary hub goes down, a secondary one automatically takes over.

The hub receives information from its Omegamon monitoring agents, which are scattered throughout the corporate network. Besides the MVS-based and Unix monitors, there will be Command Center agents for Sybase and Oracle in this quarter, followed by agents for Windows NT, Novell's NetWare, IBM's NetView and Computer Associates' Unicenter. Plans call for remote management of 19 systems.

Part of the Command Center approach is to filter alerts based on rules and parameters set by data center administrators. An inference engine fires rules that determine whether a condition passes a threshold that requires sending an alert to the central administrator. Visual programming aids let system administrators code the rules by dragging and dropping icons or defining parameters using pull-down menus.

Based on demonstrations at its headquarters, Candle has made good on enough of this audacious project to warrant a heads-up to those in traditional data centers who are overwhelmed with system management problems.

The network management systems — IBM's NetView, HP's OpenView, SunSoft's Solstice, or Cabletron's Spectrum — at this time provide little system management beyond the boundaries of the network.

Something has to fill the gap. Approaches other than Candle's are in the works, but the investment is great for system management packages. With Candle's Command Center, IS managers in traditional data centers have an option for extending their reach.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

Here comes the Sun?

The news of Apple's impending $68 million first-quarter loss spurred a swirl of speculation about how the company can survive. Sell, sell, sell was the cry of the several Wall Street types who claim that Sun is in discussion with Apple about a potential merger. Analysts said the deal on the table was a one-for-one stock swap, valued at $40 a share. Last Thursday, Apple was trading at $34. Most industry watchers claim the Sun/Apple deal has clear merits for both sides. Not only does Sun's Solaris operating system run on the PowerPC platform, but both companies share an intense rivalry with Microsoft.

Groupware gab-fest

A spokeswoman for SAP AG says the software vendor is "absolutely talking" with Lotus about integrating SAP's R/3 client/server applications with Notes groupware. Industry observers expect an announcement of an interface that would let users import Notes data to R/3 applications and vice versa to be made at next week's Lotusphere conference in Orlando, Fla. Also at Lotusphere, Brainstorm Technologies in Cambridge, Mass., plans to release a data archiving tool to manage very large Notes databases.

Win 95 users get webbed

The Internet Factory is expected to unveil the industry's first major Web server for Windows 95 early next month, according to a source close to the software maker. But it's unclear how many Windows 95 shops are aching to put up Web servers, particularly since Microsoft itself recommends running such applications on Windows NT.

Reading vs. surfing

One of the latest surveys of Internet usage profiles the impact of on-line pursuits on other pastimes. One-third of respondents said they cut their TV viewing and one-fourth cut back on long-distance phone calls, according to the American Internet User Survey, conducted by New York-based Emerging Technologies Research Group. More than 10% said they spent less time reading newspapers and magazines, yet a similar number said they were reading *more* — about the Internet.

The 5th Wave by Rich Tennant

"He should be all right now. I made him spend two and a half hours on a 'prisoners' chat line.'"

Blame it on Santa

In the wake of the monstrous East Coast blizzard, the leading Internet providers claimed that usage jumped as telecommuters and homebound users with cabin fever logged on in droves. But toward the end of the week, CompuServe was amending its analysis to place the blame on Santa Claus. A spokesman said the 25% uptick was likely due to all those Christmas gifts that came in computer boxes.

Oracle in your pocket

Look for Oracle to announce a compact version of its developer-oriented Personal Oracle within the next two weeks. To be called Personal Oracle Lite, the new version of the Oracle relational database management system is said to fit within 1M byte of memory. It was designed primarily for mobile users who need a copy of the RDBMS engine on their laptops.

Since industry analysts are having some trouble predicting the future for Apple, Computerworld called on a higher source: The Psychic Hotline. After providing the date the company was founded, Apple's personal psychic — a woman named Kat — whipped out her Tarot cards and predicted a "robbery or serious hazard" at the company. Kat warned that over the next couple of months, Apple will face differences of opinion, unhappiness, opposition, deceit and resistance. Sounds like a swell place to work! If you, too, have advice to pass along about Apple or other industry news or tips, give us a shout via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.

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